-1520-214-20

TM 11-1520-214-20

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

ELECTRONICS EQUIPMENT CONFIGURATION ARMY MODEL OH-6A HELICOPTER

(WITHOUT STANDARD LIGHTWEIGHT AVIONICS EQUIPMENT)

This copy is a reprint which includes current pages from Changes 1 through 5.

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1971

101.11:

READEX FICHE best copy available

WARNING

DANGEROUS CHEMICALS ARE USED IN NICKEL-CADMIUM BATTERIES

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide (KOH), which is a caustic chemical agent. Serious and deep burns of body tissue will result if the electrolyte comes in contact with the eyes or any part of the body. Use rubber gloves, rubber apron, and protective goggles when handling the electrolyte. If accidental contact with the electrolyte is made, use ONLY clean water and immediately (seconds count) flush contaminated areas. Continue flushing with large quantities of clean water for at least 15 minutes. Seek medical attention without delay.

WARNING

DANGEROUS VOLTAGES EXIST IN THIS CONFIGURATION

Be careful when working around the 115 vac output of static inverters and the high dc voltage levels (+240 vdc in AN/ARC-111 facility) present in the aircraft wiring.

CAUTION

Equipment in the configuration is transistorized. Before making measurements on transistorized equipment, see the instructions in paragraph 2-9.

TM 11-1520-214-20
C 5

CHANGE)
)
NO.)

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *9 October 1984*

Organizational Maintenance Manual
ELECTRONICS EQUIPMENT CONFIGURATION, ARMY OH-6A HELICOPTER (WITHOUT STANDARD LIGHTWEIGHT AVIONICS EQUIPMENT)
(NSN 1520-00-918-1523)

TM 11-1520-214-20, 23 June 1971, is changed as follows:

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2-5 and 2-6	2-5 and 2-6
2-31 and 2-32	2-31, 2-32, and 2-32.1/(2-32.2 blank)

3. File this change sheet in front of the publication.

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Chief of Staff

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ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, requirements for ROTORWING AIRCRAFT, OH-6.

Change }
No. 4 }

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DEPARTMENT OF THE ARMY
Washington, DC, *October 1982*

Organizational Maintenance Manual
ELECTRONICS EQUIPMENT CONFIGURATION, ARMY OH-6A HELICOPTER (WITHOUT STANDARD LIGHTWEIGHT AVIONICS EQUIPMENT)
(NSN 15200-00-918-1523)

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	a
1-1 through 1-4	1-1 through 1-4
1-11 and 1-12	1-11 and 1-12
2-1 through 2-6	2-1 through 2-6
2-11 and 2-12	2-11 and 2-12
Figure 5-2(1)	Figure 5-2(1)
Figure 5-2(2)	Figure 5-2(2)
Figure 5-3(3)	Figure 5-2(3)
A-1	A-1

5. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United State Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-31. Operator, Requirements for Section IV, OH-6 Aircraft.

*TM 11-1520-214-20

TECHNICAL MANUAL

NO. 11-1520-214-20

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *23 June 1971*

Organizational Maintenance Manual

ELECTRONICS EQUIPMENT CONFIGURATION ARMY MODEL OH-6A HELICOPTER

(NSN 1520-00-918-1523)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007.

In either case, a reply will be furnished direct to you.

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*** This manual supersedes TM 11-1520-214-20, 25 November 1966, including all changes.**

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5-3	Configuration wiring diagram (serial Nos. 67-16127 and subsequent) (3 parts)	Fold-in

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4 SEND FOR HELP AS SOON AS POSSIBLE

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

CHAPTER 1
INTRODUCTION

1-1. Scope

a. This manual covers organizational maintenance of the electronic configurations installed in the following (nonstandard lightweight avionics equipment) U.S. Army model OH-6A Helicopters: serial numbers 65-12918 through 65-13003; 66-14376 through 66-14419; 66-7775 through 66-7942; 66-17750 through 66-17833; and 67-16000 through 67-16686. Included are instructions for performing periodic preventive maintenance, inspection, troubleshooting, removal and replacement procedures for the communication, navigation, and intercommunication systems and ancillary electronic equipment installed in the aircraft. Also included are lists of tools and test equipment requirements for maintenance of the electronic configurations (app. B).

b. This manual supplements TM 55-1520-214-10, TM 55-1520-214-23, TM 55-1520-214-PMS, and TM 11-1520-214-ESC to provide complete organizational maintenance instructions for the electronic configurations. The electronic equipment used in the electronic configurations are covered in detail in other technical manuals which are listed in appendix A. When servicing the basic electronic components independent of the aircraft (bench maintenance), refer to the applicable technical manuals for detained technical information and maintenance procedures.

c. Maintenance of Army aircraft is transitioning to three categories of maintenance. These maintenance categories are aviation unit maintenance (AVUM); aviation intermediate maintenance (AVIM); and depot maintenance. AVUM and AVIM maintenance will replace organizational, direct support, and general support maintenance. In the interim, as maintenance units are reorganized into three categories of maintenance activities, this publication will be used by AVUM or organizational maintenance personnel for the maintenance of the electronic equipment configuration. The maintenance allowcation chart (app. B) is configured to the three-category maintenance concept where the code O represents AVUM; the code F represents AVIM and D represents depot maintenance. Those organizations not yet assigned complete AVUM responsibilities should be cautious when using this publication. Whatever maintenance is performed must consider available skills, tools, test equipment, and time required to perform the maintenance.

d. Equipment nomenclature containing an asterisk is used to indicate all models of an equipment item covered in this manual. Thus, Control, Intercommunication Set C-1611(*)/AIC represents Controls, Intercommunication Set C-1611A/AIB, C-1611B/AIC, C-1611C/AIC, and C-1611D/AIC. Receiver-Transmitter; Radio RT-742(*)/ARC-51 BX represents Receiver-Transmitters, Radio RT-742/ARC-51BX, RT-742B/ARC-51BX, and RT-742C/ARC-51BX.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records and Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy [ROD]) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

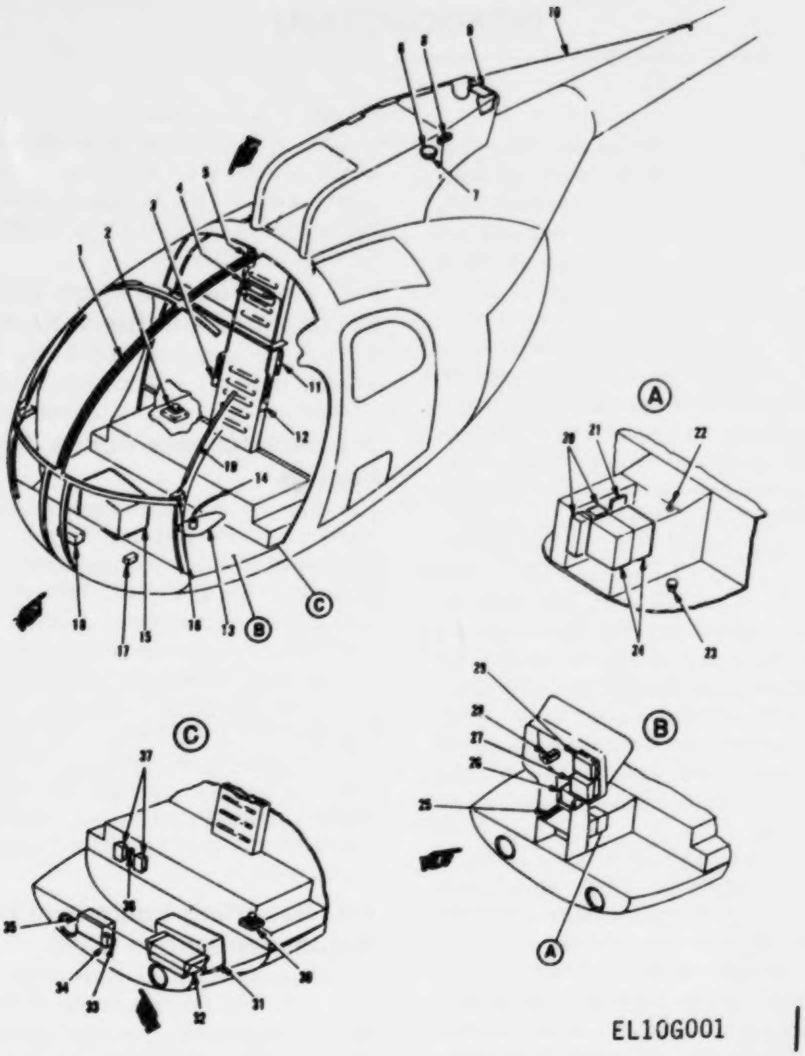
c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. Reporting Equipment Improvement Recommendations (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703-5007. We'll send you a reply.

1-5. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.



1 Fm/vhf communications antenna
2 Observer's foot switch
3 Pilot's headset jack
4 Headset/microphone filter assembly
5 Observer's headset switch-jack
6 Compensator, magnetic flux CN-405/ASN
7 Transmitter, Induction Compass T-611/ASN
8 Uhf/vhf matching unit
9 Uhf/vhf antenna
10 Adf sense antenna
11 Observer's intercom control
12 Copilot's headset jack
13 Antenna AS-1863/ARN-83
14 Adf antenna cable
15 Receiver-transmitter, radio RT-742(*)/ARC-51BX; Amplifier-Power Supply AM-4489/ARC-111 (Note 1)
16 Homing transformer
17 Hybrid network
18 Fm antenna coupler CU-1759/ARC-54
19 Fm homing antenna
20 Terminal block
21 Radio resistor assembly
22 Slaving switch
23 Copilot's foot switch
24 Control, Intercommunication set C-1611(*)/AIC
25 Radio relays
26 Control, Direction Finder C-6899/ARN-83
27 Control, radio set C-6287/ARC-51BX; receiver-transmitter RT-802/ARC-111 (Note 1)
28 Indicator, heading-radio Bearing ID-1351/A
29 Control, radio set C-3835/ARC-54
30 Directional Gyro CN-998/ASN-43
31 Receiver-transmitter, radio RT-348/ARC-54
32 Battery, storage BB-641/A
33 Inverter, power, static CU-2128/ARN-83
34 Adf receiver mounting
35 Receiver, radio R-1391/ARN-83
36 Waveshape filter
37 Static inverter, power CV-2413/ASN-43 (Note 2)

NOTES:

[1] RT-742(*)/ARC-51BX and C-6287/ARC-51BX are normally used: Amplifier-Power Supply AM-4489/ARC-111, and Receiver-Transmitter RT-802/ARC-111 are alternates for all aircraft.

[2] Single inverter is installed on aircraft serial Nos. 65-12945 and subsequent.

Figure 1-1. Location of electronic configuration components.

All material on page 1-2.1 deleted.

1-5.1. Administrative Storage

Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1.

1-6. Description of Configuration

The electronic configuration comprises the basic electronic equipment, installation items, and ancillary equipment.

a. *Basic Electronic Equipment*. Basic electronic equipments are those standardized Department of the Army communication and navigation equipments and related components which are essential parts of the aircraft communication, navigation, and intercommunication systems. Listed in the chart below are the basic electronic equipment installed in the configurations, the purpose of each equipment, and the applicable technical manual that covers the organizational maintenance of the equipment.

Equipment	Purpose	Technical Manual
Radio Set AN/ARC-51BX (fig. 1-2)	Uhf communications	TM 11-5820-518-12
Radio Set AN/ARC-111 [a] (fig. 1-3)	Vhf communications	TM 11-5821-265-20
Radio Set AN/ARC-54 (fig. 1-4)	Fm communications and homing facility	TM 11-5821-244-12
Direction Finder Set AN/ARN-83 (fig. 1-5), (less Mount MT-3605/ARN-83).	Automatic direction finding, position plotting, and reception of low frequency am signals; ac power supply for portion of heading reference facility.	TM 11-5826-225-12
Gyromagnetic Compass Set AN/ASN-43 (fig. 1-6).	Heading reference for direction finder and heading reference facilities.	TM 11-6605-202-12
Control, Inter-communication Set C-1611(*)/AIC (fig. 1-7).	Radio control and monitoring and interphone communications.	TM 11-5831-201-20
Indicator, Heading, Radio Bearing ID-1351/A (fig. 1-8) (nonstandard).	Visual display of homing heading, and bearing information; a control for synchronizing gyromagnetic compass set; and a power failure indicator.	TM 11-6605-202-12

[a] Alternate to AN/ARC-51BX (para 1-7).

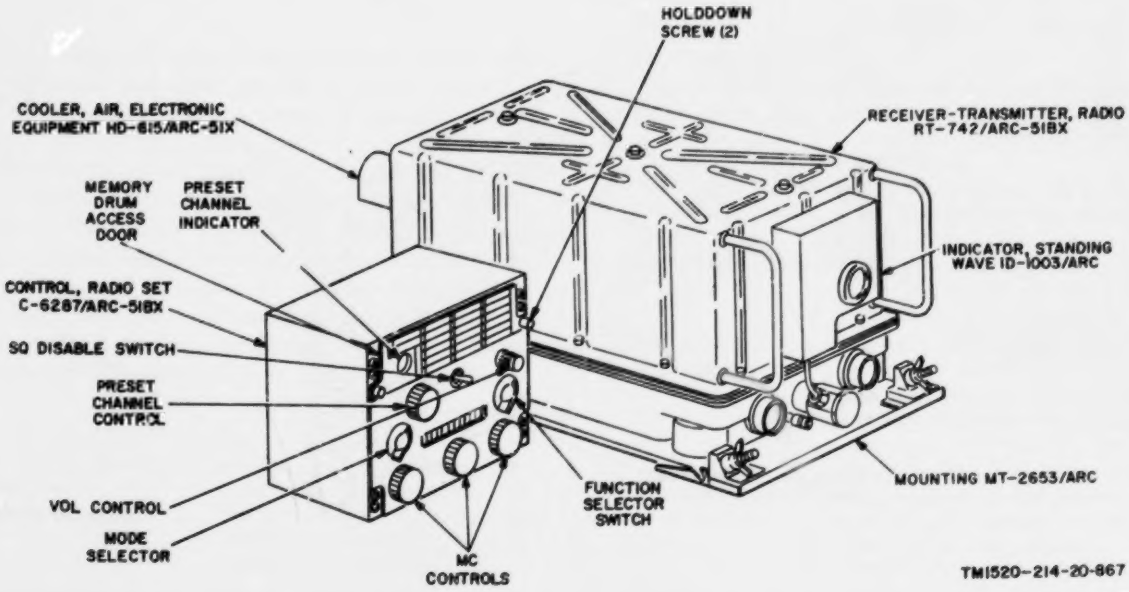

HOLDDOWN SCREW (2)
COOLER, AIR, ELECTRONIC EQUIPMENT HD-615/ARC-51X
RECEIVER-TRANSMITTER, RADIO RT-742/ARC-51BX
MEMORY DRUM ACCESS DOOR
PRESET CHANNEL INDICATOR
INDICATOR, STANDING WAVE ID-1003/ARC
CONTROL, RADIO SET C-6287/ARC-51BX
SQ DISABLE SWITCH
PRESET CHANNEL CONTROL
VOL CONTROL
MODE SELECTOR
MC CONTROLS
FUNCTION SELECTOR SWITCH
MOUNTING MT-2653/ARC
TM1520-214-20-867

Figure 1-2. Components of Radio Set AN/ARC-51BX.

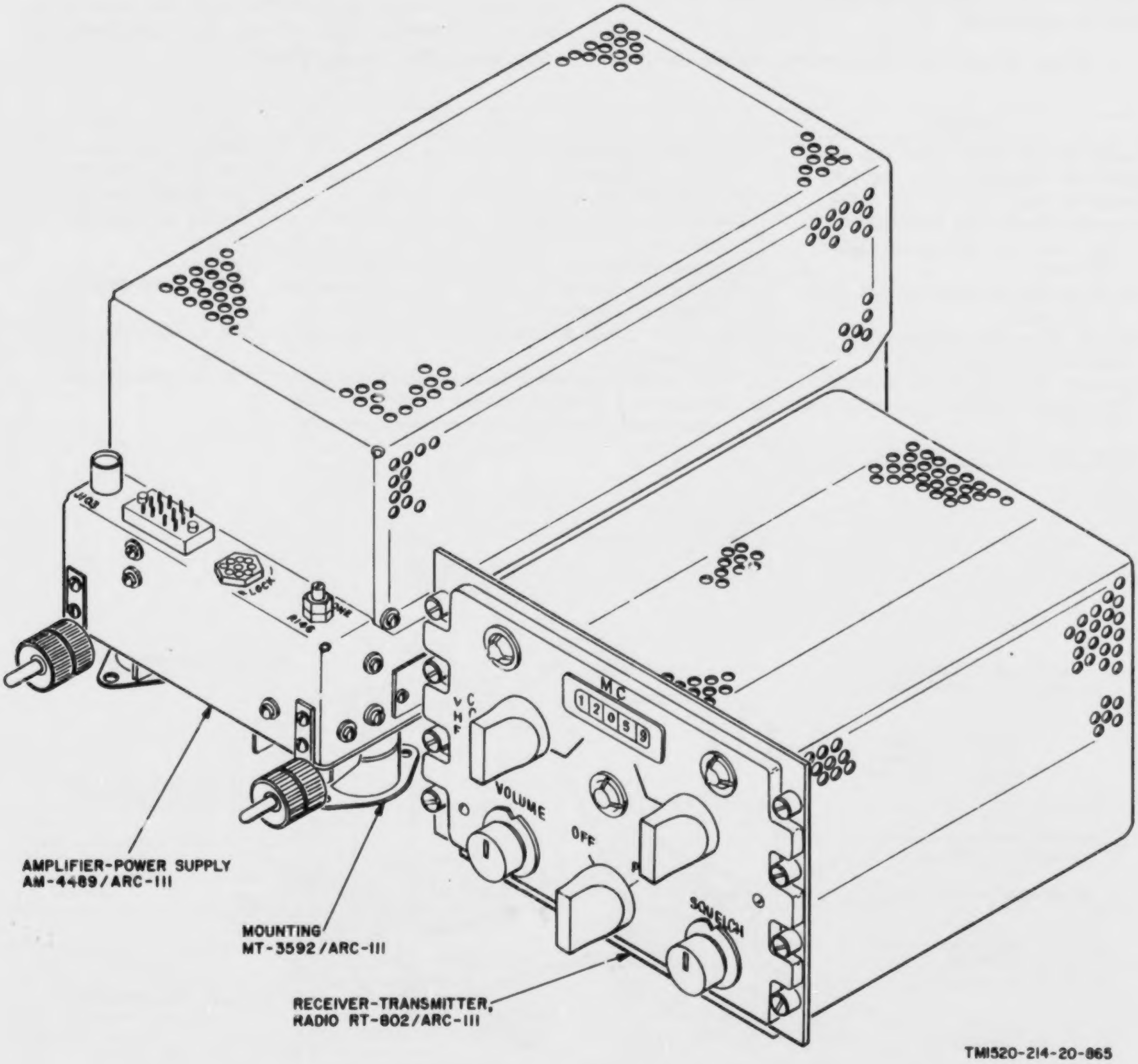

J103
LOCK
PHONE
VHF
MC
1 2 0 5 9
VOLUME
OFF
SQUELCH
AMPLIFIER-POWER SUPPLY
AM-4489/ARC-111
MOUNTING
MT-3592/ARC-111
RECEIVER-TRANSMITTER,
RADIO RT-802/ARC-111
TM1520-214-20-865

Figure 1-3. Components of Radio Set AN/ARC-111.

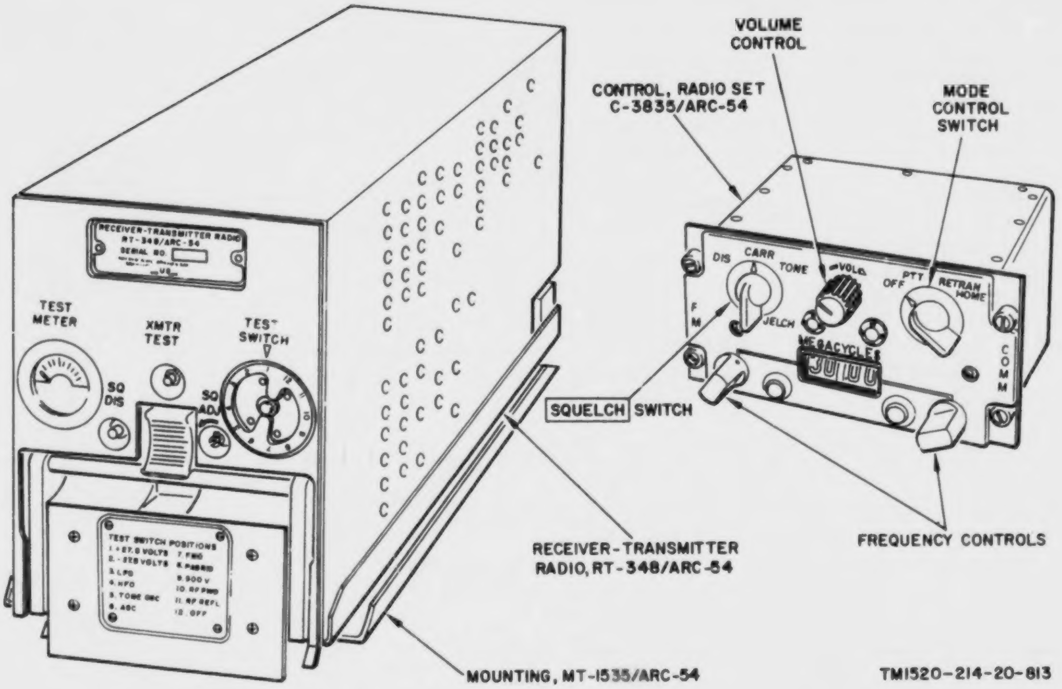
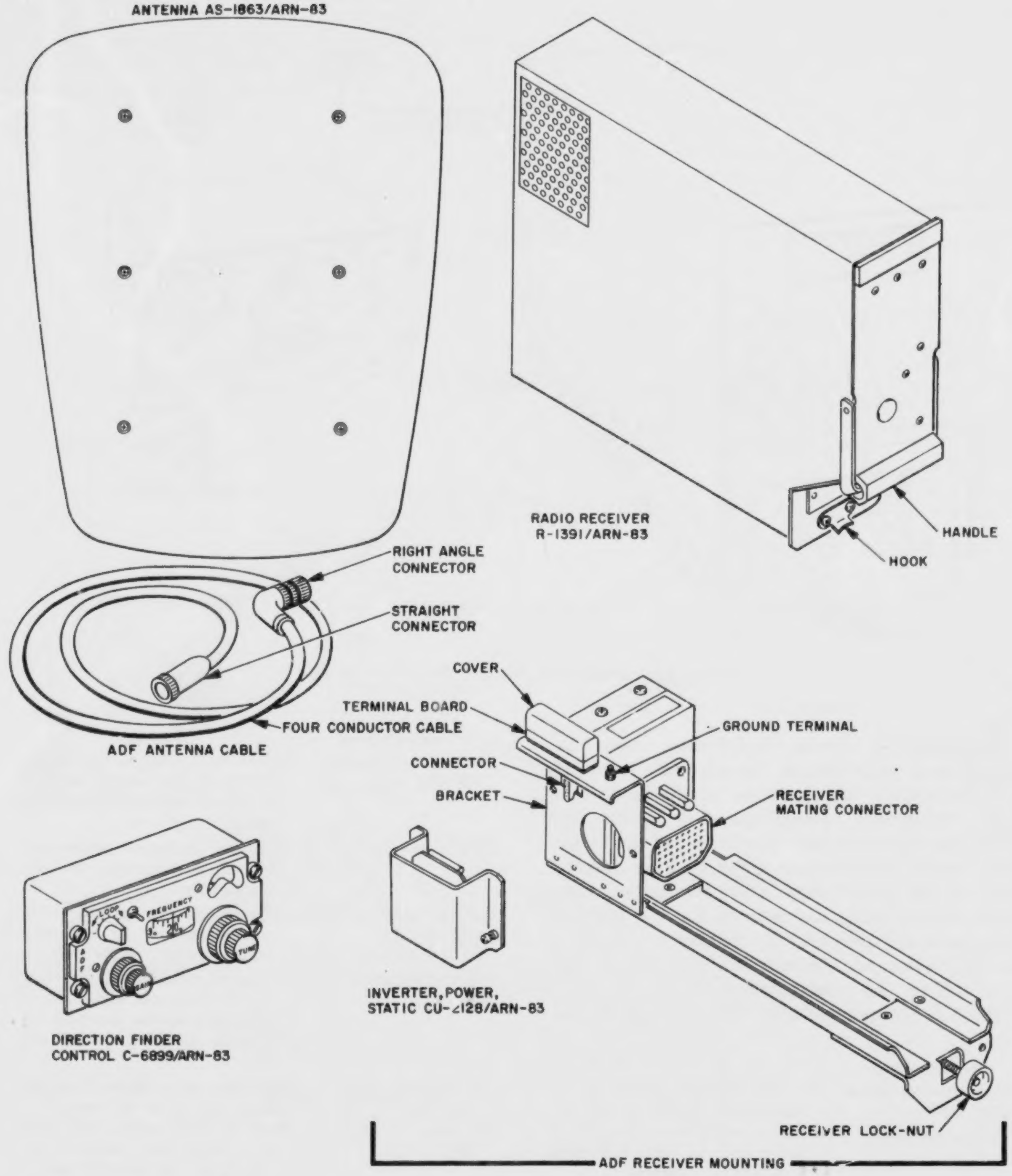

VOLUME CONTROL
CONTROL, RADIO SET C-3835/ARC-54
MODE CONTROL SWITCH
RECEIVER-TRANSMITTER RADIO RT-348/ARC-54
SERIAL NO.
TEST METER
XMTR TEST
TEST SWITCH
SQ DIS
SQ ADJ
TEST SWITCH POSITIONS
1. +27.5 VOLTS
2. -325 VOLTS
3. LFO
4. HFO
5. TONE OSC
6. AGC
7. FMO
8. PABRID
9. 500 V
10. RF PWR
11. RF REFL
12. OFF
DIS
CARR
TONE
VOL
OFF
PTT
RETRAN
HOME
FM
SQUELCH
COMM
MEGACYCLES
SQUELCH SWITCH
RECEIVER-TRANSMITTER RADIO, RT-348/ARC-54
FREQUENCY CONTROLS
MOUNTING, MT-1535/ARC-54
TM1520-214-20-813

Figure 1-4. Components of Radio Set AN/ARC-54.

b. Installation Items. Installation items are those items, provided by the aircraft manufacturer, necessary for operation of the basic electronic equipment. Paragraph 1-9 covers the applicable technical characteristics for the installation items. Refer to paragraph 1-10 for descriptions of the major installation items. Organizational maintenance instructions for the installation items are provided in chapter 2. Listed in the chart below are the installation items and purpose within the configuration. Refer to paragraph 1-8 for nomenclature and common names.

Installation item	*Purpose*
Adf receiver mounting (fig. 1-5).	Provides rigid mounting for R-1391/ARN-83 and 26 vac, 400 Hz for operation of the adf receiver and the homing, heading and bearing indicator.
Fm communications antenna (fig. 1-9).	Radiates and receives fm signals for fm radio communication.
Fm antenna coupler (fig. 1-9).	Tunes and couples fm antenna to fm radio set (communication system).
Fm homing antenna (fig. 1-9).	Receives fm signals for fm radio navigation.
Homing transformers (2) (fig. 1-9).	Provide line balance and couple dipoles of fm homing antenna to hybrid network (navigation system).
Hybrid network	Maintains 90-degree phase relationship between two fm homing signals.
Uhf/vhf antenna (fig. 1-11).	Radiates and receives uhf or vhf signals for uhf or vhf radio communication, respectively.
Uhf/vhf matching unit (fig. 1-11).	Couples rf signals from uhf radio set or from vhf radio set, to uhf/vhf antenna; provides impedance matching for RF signals.
Adf antenna cable (fig. 1-5).	Transfers radio signals from adf loop antenna to adf receiver.
Adf sense antenna (fig. 1-11).	Receives radio signals for direction finder set, resolves ambiguity at loop antenna signals.
Radio resistor assemblies (fig. 1-12).	Provides correct impedance matching and termination loads for audio circuits in electronic configuration.
Radio relays (fig. 2-12 and 2-13).	Perform remote switching functions controlled by press-to-talk switches and interphone selector switches.


ANTENNA AS-1863/ARN-83
RADIO RECEIVER
R-1391/ARN-83
HANDLE
HOOK
RIGHT ANGLE
CONNECTOR
STRAIGHT
CONNECTOR
FOUR CONDUCTOR CABLE
ADF ANTENNA CABLE
COVER
TERMINAL BOARD
GROUND TERMINAL
CONNECTOR
BRACKET
RECEIVER
MATING CONNECTOR
LOOP
FREQUENCY
ADF
GAIN
TUNE
INVERTER, POWER,
STATIC CU-2128/ARN-83
DIRECTION FINDER
CONTROL C-6899/ARN-83
RECEIVER LOCK-NUT
ADF RECEIVER MOUNTING

NOTES:

1. AN/ARN-83 SHOWN LESS MOUNTING MT-3605/ARN-83.
2. INVERTER, POWER, STATIC CU-2128/ARN-83 IS PART OF ADF RECEIVER MOUNTING.

TM1520-214-20-864

Figure 1-5. Components of Direction Finder Set AN/ ARN-83, adf receiver mounting and adf antenna cable.

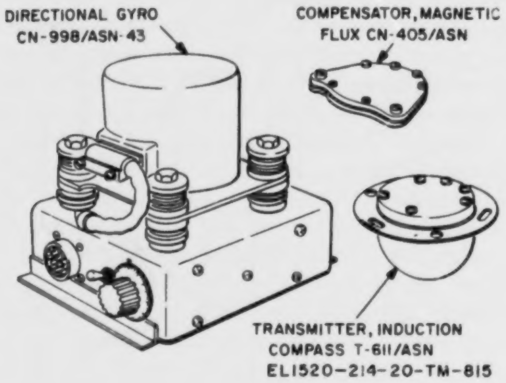


Figure 1-6. Components of Gyromagnetic Compass Set AN/ASN-43.

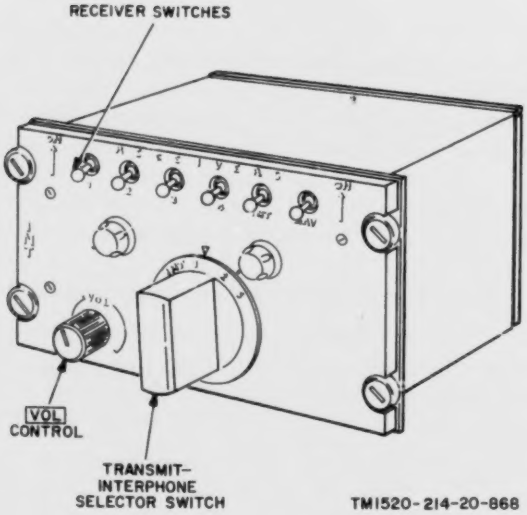


Figure 1-7. Intercommunication Set Control C-1611 (*)/AIC.

Installation item	*Purpose*
Copilot's foot switch (fig. 2-7).	Parallels cyclic stick hand press-to-talk switch for copilot.
Pilot's and copilot's headset jacks (fig. 1-12).	Connects headset-microphones for pilot and copilot.
Observer's headset switch—jack (fig. 1-12).	Connects headset-microphone and provides press-to-talk switch for observer.
Observer's foot switch (fig. 2-4).	Parallels press-to-talk switch for observer.
Headset-microphone filter assembly (fig. 1-12).	Filters noise from audio signals generated by pilot's, copilot's and observer's microphones. Terminal point for cables connecting headset-microphones.
Terminal block (2) (fig. 1-12).	Interconnects power, operational control, and audio circuits in the electronic configurations.
Terminal board (fig. 1-5).	Interconnects, and is distribution point for, low voltage ac circuits of direction finder set and homing, heading, and bearing indicator.
MAGNETIC-DIR GYRO slaving switch (fig. 2-10).	Slaves AN/ASN-43 to earth's magnetic field for MAG mode operation.

c. *Ancillary Equipment.* The ancillary equipment items (fig. 1-1) in the electronic configuration are an aircraft battery, a waveshape filter, and one or two static inverters. Organizational maintenance instructions for these ancillary items are provided in chapter 4. The aircraft battery, waveshape filter, and the static inverters serve the following purposes:

(1) The aircraft battery supplies 28-volt dc power to the aircraft electrical system when the aircraft engine is not operating. When the aircraft engine is operating, the aircraft battery is disconnected from the aircraft dc bus (TM 55-1520-214-20).

(2) The waveshape filter (fig. 1-1) filters 115-volt, 400-Hz power from the static inverter before application to Gyromagnetic Compass Set AN/ASN-43 and the homing, heading, and bearing indicator. Later model static inverters incorporate waveshape filters within the design.

(3) One static inverter supplies 115-volt, 400-Hz power for operation of Gyromagnetic Compass Set AN/ASN-43, the attitude gyro, and Mark XII Computer KIT-1A/TSEC (identification equipment; refer to para 1-7). The second static inverter, when installed, is used to supply 115-volt, 400-Hz power to the attitude gyro (and identification equipment, if installed) in case of failure of the first inverter.

NOTE

The second static inverter has been deleted from aircraft serial numbered 65-12945 and subsequent aircraft.

1-7. Differences in Configuration

Army model OH-6A aircraft are equipped with one of two different electronic configurations. One

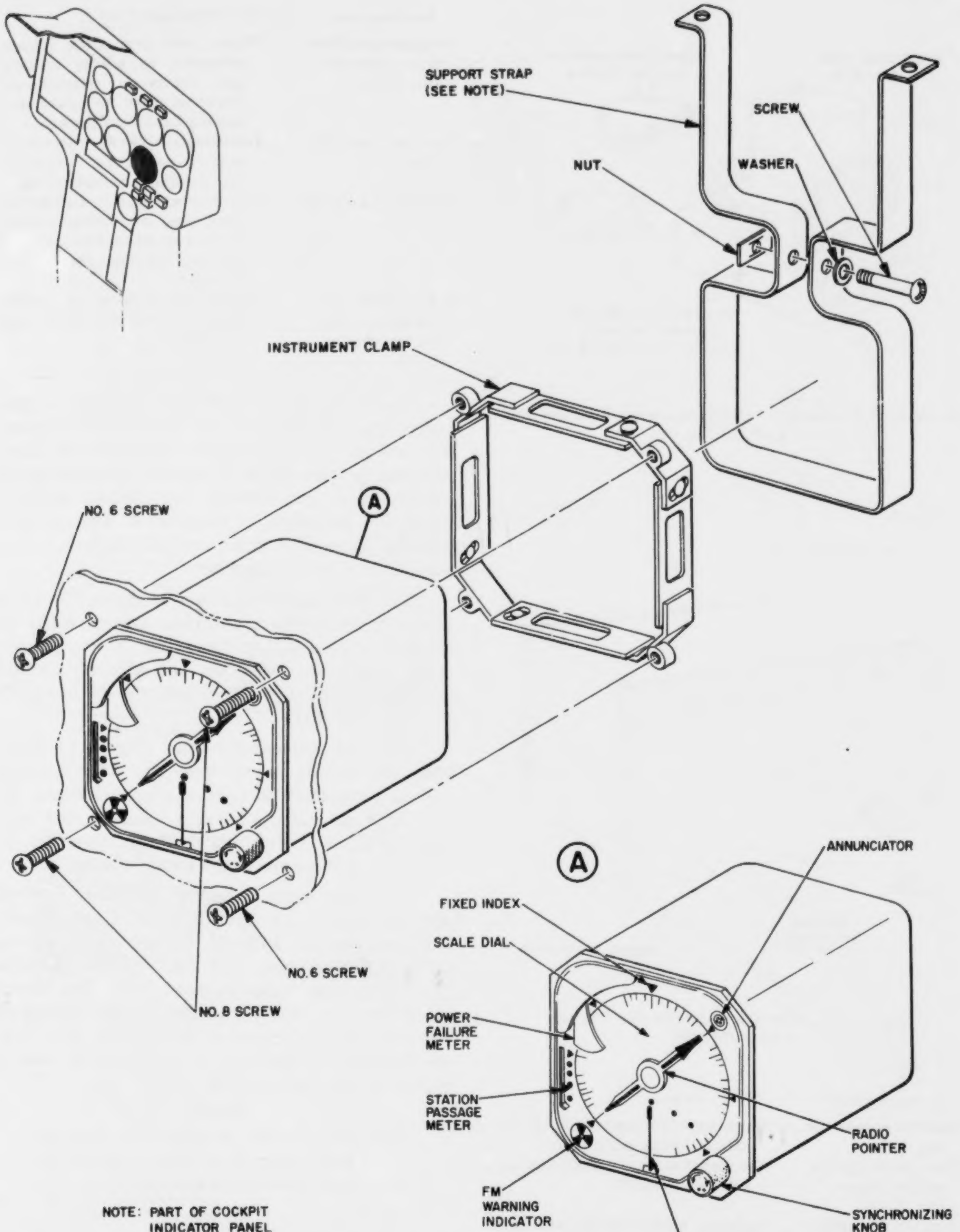

SUPPORT STRAP
(SEE NOTE)
SCREW
NUT
WASHER
INSTRUMENT CLAMP
A
NO. 6 SCREW
NO. 6 SCREW
NO. 8 SCREW
A
ANNUNCIATOR
FIXED INDEX
SCALE DIAL
POWER FAILURE METER
STATION PASSAGE METER
RADIO POINTER
FM WARNING INDICATOR
SYNCHRONIZING KNOB
STEERING METER
TM1520-214-20-846
NOTE: PART OF COCKPIT INDICATOR PANEL ASSEMBLY.

Figure 1–8. Indicator, Heading—Radio Bearing ID–1351/A.

configuration applies to aircraft 65-12918 through 67-16126. The other applies to subsequent serial numbered aircraft. The basic electronic equipment of these two configurations are the same. They differ only in the wiring modifications and the use of an additional terminal block assembly in aircraft serial Nos. 65-12918 through 67-16126. Equipment for which provisions are made may or may not be installed. All aircraft contain provisions for the installation of a uhf radio set or an alternate installation of a vhf radio set. In addition, all aircraft contain space, weight, and power provisions for additional communication and identification equipment. Refer to paragraph 1-8 for a listing of the different installation items installed in the two configurations. The differences in basic electronic equipment for the configurations are listed in a below; items of equipment for which space, weight, and power provisions exist are listed in *b* below.

a. Differences in Basic Electronic Equipment for Configurations. The electronic configurations for aircraft differ in accordance with their operating locations as indicated in the chart below.

NOTE

Differences in models of Control, Intercommunication Set C-1611(*)/AIC are covered in TM 11-5831-201-15 (para 1-1*c*).

Geographic location	Normal	Alternate	Direction finder
CONUS	AN/ARC-51BX	--------	AN/ARN-83
USARPAC	AN/ARC-51BX	--------	AN/ARN-83
USARAL	AN/ARC-51BX	--------	AN/ARN-83
USAREUR	--------	AN/ARC-111	AN/ARN-83
USARSOUTHCOM	--------	AN/ARC-111	AN/ARN-83

b. Space, Weight, and Power Provisions. Space, weight, and power provisions are included in the configuration for the following additional electronic equipment: Radio Set AN/ARC-98 (high frequency radio set); Receiver Set R-1297/AR (fm auxiliary receiver); Transponder Set AN/APX-68, and Mark XII Computer KIT-1A/TSEC (identification equipment).

1-8. Nomenclature and Common Names

The chart below lists the nomenclature and common names assigned to the basic electronic equipment, installation items, and ancillary equipment that make up the electronic configurations.

Nomenclature	*Common name*
Army model OH-6A Helicopter	Aircraft
Radio Set AN/ARC-51BX	Uhf radio set
Receiver-Transmitter, Radio RT-742(*)/ARC-51BX	Uhf receiver-transmitter
Control, Radio Set C-6287/ARC-51BX	Uhf control unit
Mounting MT-2653/ARC	Uhf radio set mounting
Cooler, Air, Electronic Equipment HD-615/ARC-51BX	External blower
Indicator, Standing Wave Ratio ID-1003/ARC	Reflectometer
Radio Set AN/ARC-111	Vhf radio set [a]
Receiver-Transmitter, Radio RT-802/ARC-111	Vhf receiver-transmitter
Amplifier-Power Supply AM-4489/ARC-111	Amplifier-power supply
Mounting MT-3592/ARC	Vhf amplifier-power supply mounting
Radio Set AN/ARC-54	Fm radio set
Receiver-Transmitter, Radio RT-348/ARC-54	Fm receiver-transmitter
Control, Radio Set C-3835/ARC-54	Fm control unit
Mounting MT-1535/ARC-54	Fm radio set mounting
Direction Finder Set AN/ARN-83 (less Mount MT-3605/ARN-83)	Direction finder set
Receiver, Radio R-1391/ARN-83	Adf receiver
Control, Direction Finder C-6899/ARN-83	Adf control unit
Antenna AS-1863/ARN-83	Adf loop antenna
Mount, Rigid with Inverter 369A4422 [c]	Adf receiver mounting
Mounting 390R-6A [d] (modified)	Rigid mount
Inverter, Power, Static CU-2128/ARN-83	Dc-to-ac inverter
Board, terminal MS27212-1-2	Terminal board
Antenna cable, Loop 440L-8B [d]	Adf antenna cable
Gyromagnetic Compass Set AN/ASN-43	Gyromagnetic compass set
Transmitter, Induction Compass T-611/ASN	Compass transmitter
Compensator, Magnetic Flux CN-405/ASN	Compensator

Nomenclature	*Common name*
Directional Gyro CN-998/ ASN-43	Directional gyro
Switch, Toggle, Single Pole MS35058-22	Slaving switch
Control, Intercommunication Set C-1611(*)/AIC	Intercom control
Adf sense antenna	Sense antenna
Antiprecipitation wire	Wire
Tension unit (5ARM300-2CN)[v]	Improved tension unit
Aft retainer (MS20115-4)	Retainer
Forward retainer (10ARM300-18CN)[v]	Locking lever (replacement)
Uhf/vhf antenna	Uhf/vhf antenna[a]
Matching unit, antenna 06-21-04700[g] or TRXUV[q] (369A4575 or 369A4575-3)[c]	Uhf/vhf matching unit
Indicator, Heading-Radio Bearing ID-1351/A (RH-102[h])	Homing, heading, and bearing indicator
Filter Assembly-Mike and Headset 369A4420[c]	Headset-microphone filter assembly
Filter, Microphone-Pilot and Copilot[j] 369A4587 or 369A4687[c]	Microphone filter
Cable Assembly, Headset Model CA-137[k]	Pilot or copilot headset jack
Microphone Jack-Switch 369A4412[c] or 369A4597[c]	Observer's switch jack
Fm communications antenna[f]	Fm communications antenna
Coupler CU-1759/ARC-54 (06-61-04610[g])	Fm antenna coupler[r]
Coupler CU-1759/ARC-54 (TRX-FM[q]) 369A4585-3[c]	Fm antenna coupler[s]
Coupler, FM (ESD203371) (CCC 10-42)[q]	Fm antenna coupler, nontunable
Fm homing antenna	Fm homing antenna
Network, Hybrid Circuit, 90° QH-1-53/608226A[t] (369A4507[c])	Hybrid network
Transformer, Homing PDX-20-53/608252A[t] (369A4508[c])	Homing transformer
Static Inverter, Power CV-2413/ASN-43 (26530287[m], 369A4554[c]	Static inverter
Filter, Waveshape AM12049[n]	Waveshape filter
Battery, Storage BB-641/A (19KO-13)[p], (369A4556 or 369A4530[u])[c]	Aircraft battery
Resistor Assembly 369A4544[c] (replaced by 369A4544-605 or 369A4544-603)	Radio resistor assembly EQ500
Resistor Assembly, Observer 369A4416[b,c]	Radio resistor assembly EQ501
Relay (DPDT 30-01G) (369A4557[c])	Radio relay
Switch MS25039-1	Copilot's foot switch
Switch 369A4463[c]	Observer's foot switch

NOTES

[a] Alternate for uhf radio set.

[b] Used for impedance matching for observer's intercom.

[c] Part No. of Hughes Tool Co., Culver City, Calif.

[d] Model No. of Collins Radio Co., Cedar Rapids, Iowa.

[e] Part of aircraft inlet aft fairing.

[f] Part of aircraft canopy frame.

[g] Part No. of Electronic Specialty Co., L.A., Calif.

[h] Sperry Phoenix, Phoenix, Ariz.

[j] Manufactured by Guide Industries, Inc., L.A., Calif.

[k] Model No. of Aviel Electronics, Van Nuys, Calif., Model No. CA-166 was installed in a/c No. 66-7905 and subsequent during production and in earlier aircraft by MWO 55-1520-214-30/19; CA-129 may be installed.

[m] Part No. of Vapor Corp, Chicago, Ill.

[n] Part No. of Adams Maxwell, Inc., Culver City, Calif.

[p] Model No. of Gulton Industries, Metuchin, N.J.

[q] Part No. of Communication Components Corp., Long Beach, Calif.

[r] Used on serial Nos. 65-12918 through 65-12974.

[s] Used on serial Nos. 65-12975 through 67-16326.

[t] Part number of Merrimac Research and Development Company, Irvington, N.J.

[u] Part No. of Hughes Tool Co., Culver City, Calif. effective with a/c serial Nos. 66-17790 through 67-16686 during production, and in previously delivered aircraft by modification.

[v] Part number of LAPA 300 Inc., Miami Springs, Fla.; replaces contractor furnished rubber tension unit.

1-9. Installation Items Technical Characteristics

Technical characteristics for applicable major installation items are as follows:

a. Fm Communications Antenna.

Type	Structural (equivalent to whip).
Physical length	97 in. (approx).
Type of feed	End.
Frequency range	30 to 69.96 MHz.
Voltage standing wave ratio:	
30 to 35 MHz	3.5 to 1, or less.
35 to 69.96 MHz	3.0 to 1, or less.

b. Fm Antenna Coupler.

Frequency range	30 to 69.96 MHz tunable, 30 to 70 MHz nontunable.
Tuning	Electromechanical or static.
Voltage standing wave ratio	3 to 1, or less, tunable. 5 to 1, or less, nontunable.
RF power capability	20 watts, tunable, 25 watts, nontunable.

c. Fm Homing Antenna.

Type	Two foil tape dipoles (directional).

Frequency	30 to 42 and 48.5 to 69.95 MHz.

d. Homing Transformer.

Frequency	30 to 70 MHz.
Insertion loss	1 db or less.

e. Hybrid Network.

Frequency range	30 to 76 MHz.
Insertion loss	1 db, or less.
Voltage standing wave ratio	1.35 to 1 or less.
Phase control	Maintain 90° ±5° differential between output signals.

f. Uhf/vhf Antenna.

Type	Structural (aluminum plate).

1–10. Description of Installation Items

Descriptions of minor installation items (installation items that are essentially standard and common in physical construction and function) are omitted from this paragraph. A description of each major installation item (an installation item peculiar to the electronic configuration, or that is not standard or common in physical construction or function, and which performs a prime function in the electronic configuration) follows.

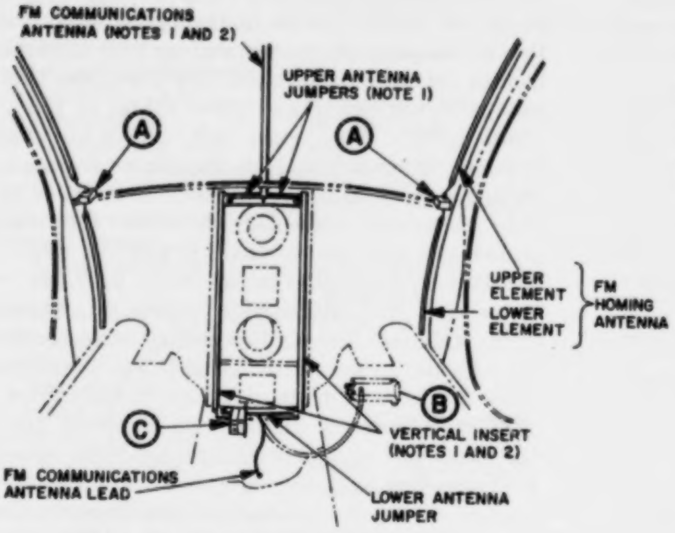
a. Adf Receiver Mounting (fig. 1–5). The adf receiver mounting consists of a rigid mount, a bracket, terminal board, ground terminal, and Inverter, Power, Static CU–2128/ARN–83 (dc-to-ac inverter). The rigid mount contains a rectangular chassis at the rear of an aluminum base. The rectangular chassis supports the receiver mating connector. An opening at the rear of the rectangular chassis provides access to the rear of the receiver mating connector. A grommet is located on the left side of the rectangular chassis for entry of electrical wiring. A captive receiver locknut on a pivoted stainless steel threaded shaft is anchored to the front of the aluminum base. The ground terminal and a terminal board with a protective cover, are secured to the top of a bracket, made of aluminum, which is riveted to the right rear side of the rectangular chassis. The dc-to-ac inverter is held to the side of the bracket below the terminal board and ground terminal by two captive screws. A connector on the dc-to-ac inverter mates with a connector that is attached to and extends through the bracket. Four mounting holes in the aluminum base permit rigid mounting of the adf receiver mounting in the aircraft.

b. Fm Communications Antenna (fig. 1–9). The fm communications antenna is integral to the aircraft structure, since it is essentially formed by the center frame in the upper center section of the aircraft canopy and vertical aluminum inserts (strips) bonded into the fiberglass center canopy at the center and lower center of the aircraft canopy. The upper left and upper right antenna jumpers attach to the center frame, and an angle at the top of each vertical strip, to provide electrical connection between the center frame and the two vertical strips. An angle at the bottom of each vertical strip provides two connection and attachment points to which a lower antenna jumper is attached. One terminal lug of a flat braid electrical lead (fm communications antenna lead) is attached to the center of the lower antenna jumper. A terminal lug on the other end of the fm communications antenna lead provides a connection point for external connection of the fm communications antenna. Components of the fm communications antenna are electrically isolated from all other aircraft structural members that are at aircraft ground potential. The fm communications antenna is electrically comparable to a conventional whip antenna.

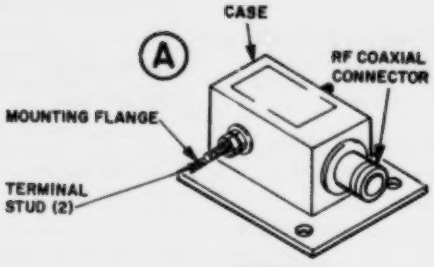
c. Fm Antenna Coupler (figs. 1–9 and 1–10). The fm antenna coupler is a rectangular unit with a removable metal base. Figure 1–9 depicts two tunable fm antenna couplers. A nontunable fm antenna coupler (fig. 1–10) replaces the tunable models. The nine-conductor control cable previously utilized with the tunable models is stowed when the nontunable model is installed by MWO 55–1520–214–30/28. A branched stretch-type antenna lead is provided with the fm antenna coupler.

d. Fm Homing Antenna (fig. 1–9). The fm homing antenna consists of two isolated, directional dipoles, mounted vertically along the right and left edges of the canopy. The dipole elements are 22-inch strips of aluminum foil tape that are bonded to the inside surface of the plastic canopy. Electrical contact to each of the foil elements is made by means of a wedgeshaped coupler support which is bonded to the canopy at the terminating end of the element. A threaded metal insert in the support contacts the metal foil element and provides for a screw terminal connection for the coupling wire to the homing transformer.

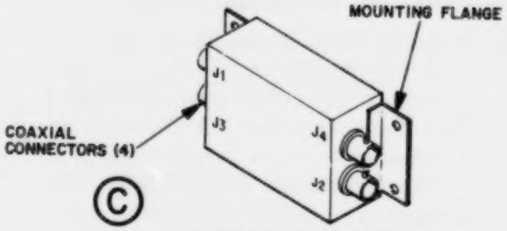
e. Homing Transformer (fig. 1–9). The homing transformer is a sealed unit containing two terminal studs for input connections from the


FM COMMUNICATIONS ANTENNA (NOTES 1 AND 2)
UPPER ANTENNA JUMPERS (NOTE 1)
A
A
UPPER ELEMENT
LOWER ELEMENT
FM HOMING ANTENNA
B
C
VERTICAL INSERT (NOTES 1 AND 2)
FM COMMUNICATIONS ANTENNA LEAD
LOWER ANTENNA JUMPER

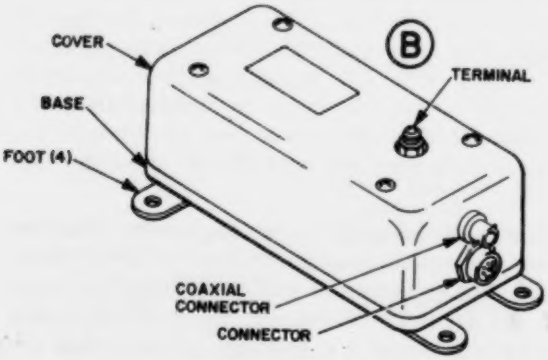
FM COMMUNICATIONS ANTENNA AND FM HOMING ANTENNA


CASE
A
RF COAXIAL CONNECTOR
MOUNTING FLANGE
TERMINAL STUD (2)

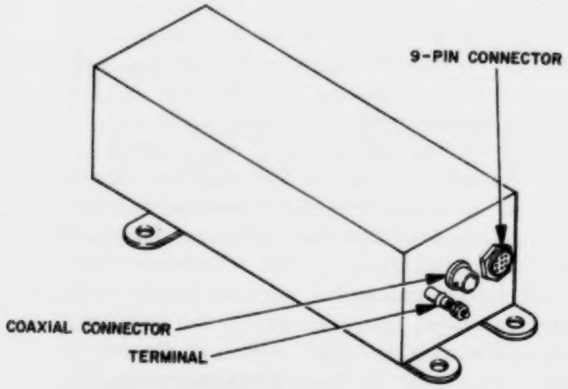
HOMING TRANSFORMER


MOUNTING FLANGE
J1
J3
J4
J2
COAXIAL CONNECTORS (4)
C

HYBRID NETWORK


COVER
B
TERMINAL
BASE
FOOT (4)
COAXIAL CONNECTOR
CONNECTOR

FM ANTENNA COUPLER


9-PIN CONNECTOR
COAXIAL CONNECTOR
TERMINAL

FM ANTENNA COUPLER (NOTE 3)

NOTES:

1. PART OF FM COMMUNICATIONS ANTENNA
2. PART OF AIRCRAFT CANOPY
3. USED ON UNITS EQUIPPED WITH SHUNT STRAP BETWEEN FM COMMUNICATIONS ANTENNA AND INSTRUMENT PANEL

EL10G009

Figure 1-9. Major installation items, fm antenna equipment.

dipole elements, and one coaxial receptacle for connecting the transformer output to the hybrid network through a double-shielded cable. One transformer is used for each pair of foil elements. They are mounted at each end of the horizontal center frame of the canopy. They are installed by means of a T-shaped support bracket which attaches the transformer directly to the metal frame member.

f. Hybrid Network (fig. 1-9). The hybrid network is a sealed unit containing four coaxial cable receptacles for connecting the two inputs from the homing transformers and the two outputs to the fm receiver through double-shielded cables. The hybrid network is mounted on the left-hand side of the center beam in the electronics compartment (under the pilot's floor).

g. Uhf/Vhf Antenna (fig. 1-11). The uhf/vhf antenna, an integral part of the aft engine inlet fairing, consists of a triangular shaped aluminum sheet, approximately 17 inches long and 8 inches wide, formed and bonded to the rear center skin panel of the engine aft inlet fairing. A bracket is spot-welded to the pointed lower extremity of the aluminum sheet, and extends forward through a slot in the aft skin of the engine aft inlet fairing into the area covered by the engine aft inlet fairing. A static air port, for the aircraft static line (TM 55-1520-214-20), is located at the approximate vertical and horizontal center of the triangular vertical portion of the aluminum sheet. The uhf/vhf antenna is electrically isolated from the metal aircraft structure. A hole in the bracket permits attachment of a uhf/vhf antenna lead for electrical connection of the uhf/vhf antenna to the uhf/vhf matching unit.

h. Uhf/Vhf Matching Unit (fig. 1-11). The uhf/vhf matching unit is housed in a sealed rectangular case on a rectangular mounting base (both aluminum), and contains an RF coaxial connector and a terminal stud diagonally located at opposite ends of the case. A flat braided lead (uhf/vhf antenna lead) is attached to the terminal stud. An insulator electrically isolates the threaded terminal stud from the case. The uhf/vhf antenna lead is provided for connection to the uhf/vhf antenna. Four mounting slots are located at opposite ends of the mounting base.

i. Adf Antenna Cable (fig. 1-5). The adf antenna cable is a four-conductor, flexible cable,

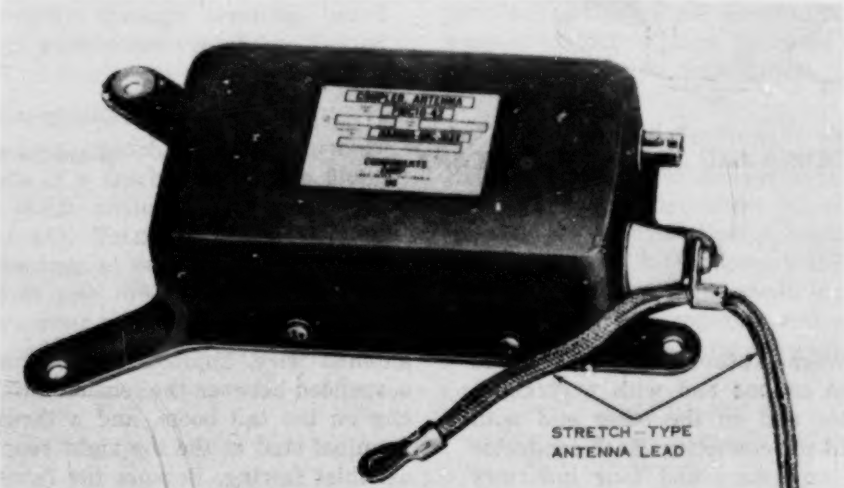


Figure 1-10. Fm antenna coupler, nontunable.

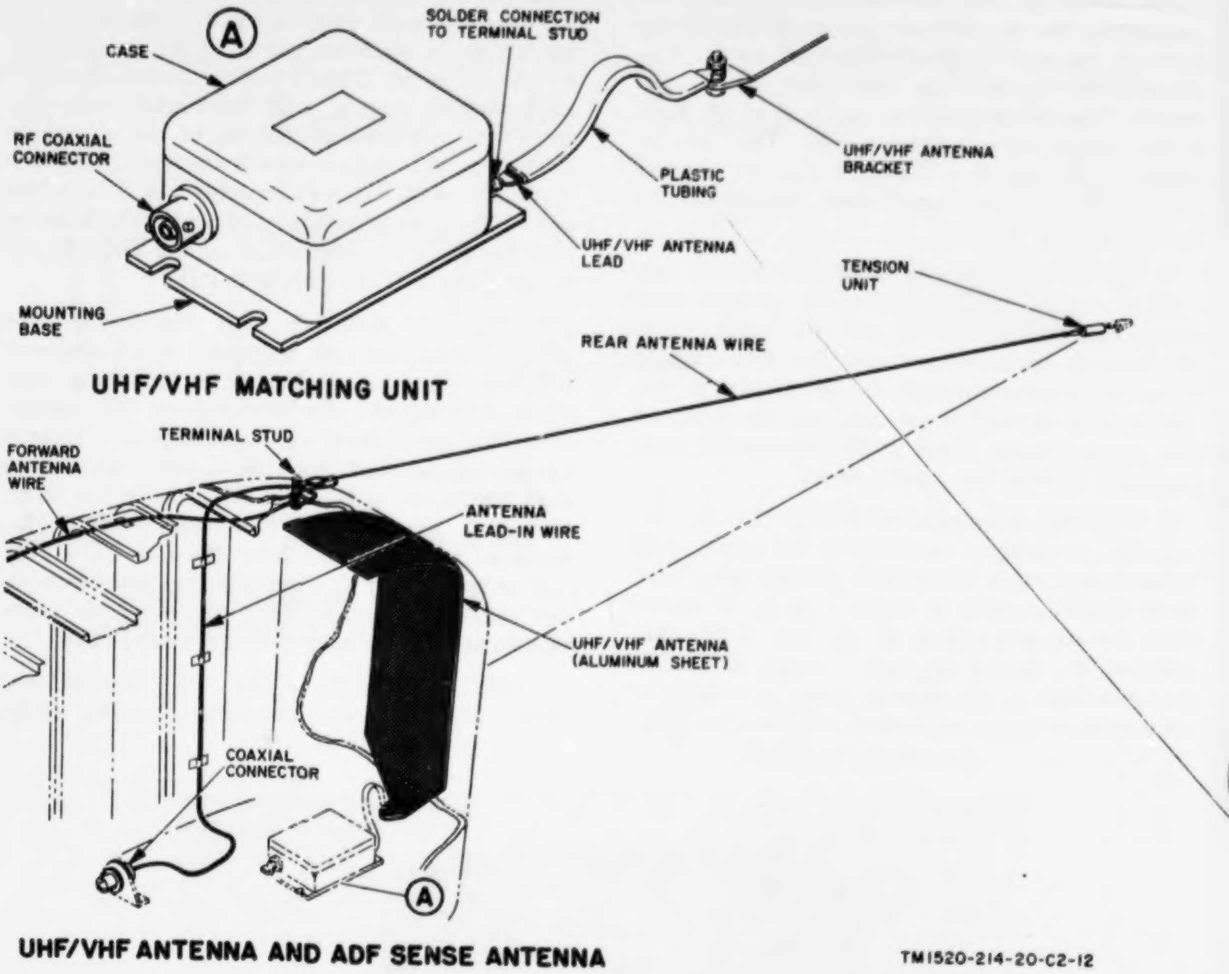

A
CASE
SOLDER CONNECTION TO TERMINAL STUD
RF COAXIAL CONNECTOR
UHF/VHF ANTENNA BRACKET
PLASTIC TUBING
UHF/VHF ANTENNA LEAD
TENSION UNIT
MOUNTING BASE
REAR ANTENNA WIRE
UHF/VHF MATCHING UNIT
TERMINAL STUD
FORWARD ANTENNA WIRE
ANTENNA LEAD-IN WIRE
UHF/VHF ANTENNA (ALUMINUM SHEET)
COAXIAL CONNECTOR
A
UHF/VHF ANTENNA AND ADF SENSE ANTENNA
TM1520-214-20-C2-12

Figure 1-11. Major installation items, uhf/vhf antenna and adf sense antenna.

6 1/2 feet long, weighs approximately 1/2 pound and is terminated on one end with a straight, eight-pin connector and on the other end with a right angle, eight-pin connector. Each conductor is shielded; two capacitors and four inductors (not shown), are sealed in the adf antenna cable, directly behind the straight connector, to provide interference free operation of the adf loop antenna.

j. Adf Sense Antenna (fig. 1-11).

(1) The factory installed adf sense antenna consists of forward and rear antenna wires, an antenna lead-in wire, a tension unit, and associated connecting and suspension hardware. The rear antenna wire, approximately 83 inches long, is suspended between the tension unit, attached to a clip on the tail boom, and a threaded electrical terminal stud at the top right rear of the engine aft inlet fairing. Because the fairing is made of fiberglass material, no isolation of the terminal stud is necessary. The tension unit applies and maintains tension on the rear antenna wire. The forward antenna wire, approximately 36 inches long, is connected to the underside of the threaded electrical terminal and taped to the upper right inside corner of the engine aft inlet fairing. One end of the antenna lead-in wire is also connected to the underside of the threaded electrical stud; the other end is soldered to an RF coaxial con-

nector mounted on a clip attached to the boom fairing under the engine aft inlet fairing. The RF coaxial connector provides a connection point for the adf sense antenna cable.

(2) The adf sense antenna basic dimensions are retained whenever the antenna is repaired or replaced. Variations in the suspension hardware and the antenna wire used is dependant upon the materials available. Failures in the initially installed rubber tension unit has resulted in the use of standard metal tension units.

k. Radio Resistor Assemblies (fig. 1-12). The radio resistor assemblies consist of 2 terminal boards containing 21 resistors and 1 capacitor soldered to the terminals. Two threaded standoffs, attached to the underside of the terminal boards are provided for mounting purposes.

l. Headset Jacks (fig. 1-12). The pilot's (and copilot's) headset jack consists of a cylindrical plastic headset jack attached to a coiled, flexible cable containing three conductors, one of which is shielded. The free end of the three conductors and shield are soldered to terminal block snap-in contacts for mating with terminals on terminal block modules. The observer's jack consists of connector U-94/A with an attached six-conductor cable. The snap-in contacts connect to the microphone filter assembly through terminal board TB503. A clip and pushbutton switch are located on the U-94A/U.

m. Headset-Microphone Filter Assembly.

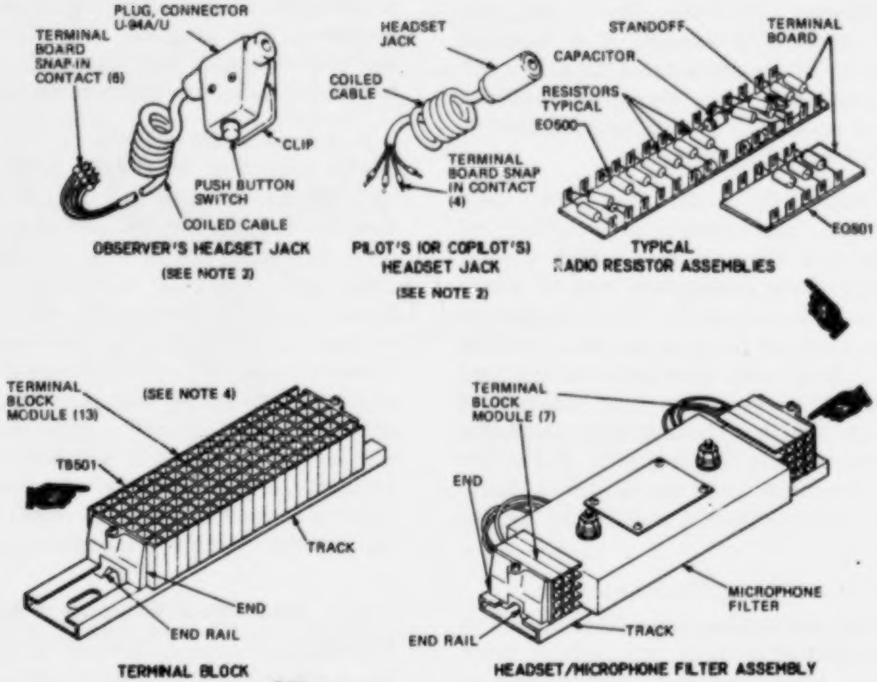
(1) The headset-microphone filter assembly essentially consists of a track, microphone filter, seven terminal block modules, and associated hardware (fig. 1-12). Terminal block modules, with terminal openings at both the top and bottom, are secured at both the left and right sides of the microphone filter on the track. The microphone filter is a sealed unit. The seven terminal block modules are wedged and held in place between either side of the microphone filter and two ends which are secured to the track by two end rails and associated hardware. Ten terminal leads (wires) from the microphone filter, each terminated in a terminal block snap-in contact, connect to terminals on the underside of the terminal block modules. The terminal block modules and microphone filter are removable.

(2) The headset-microphone filter assembly (model AM12173) is an improved assembly and is installed to eliminate numerous audio circuit problems. The assembly consists of a mounting bar and clamp, a filter assembly containing potted filters, and a protective cover plate.

n. Terminal Blocks (fig. 1-12). The terminal blocks consist of 20 (24 for serial No. 67-16127 and subsequent) molded plastic terminal block modules that are wedged and secured between two ends which are secured to a track by two end rails and attaching hardware. Each terminal block module is separately removable, with or without internal bussing (electrical contact between terminals), and contains six terminal openings for connecting and securing terminal block snap-in contacts. Once a terminal block snap-in contact is pushed into a terminal opening the terminal of the module secures the terminal block snap-in contact in place; terminal blocks are used for interunit circuit connections.

1-11. Additional Equipment Required

Headset-microphones are not supplied as part of the electronic configuration but are required for use with the configuration. A headset-microphone, such as Headset-Microphone H-101A/U or similar headset-microphone equipment, is required for the pilot; also for the copilot's and observer's positions when those positions are used.


PLUG, CONNECTOR
U-94A/U
TERMINAL BOARD SNAP-IN CONTACT (6)
CLIP
PUSH BUTTON SWITCH
COILED CABLE
HEADSET JACK
COILED CABLE
TERMINAL BOARD SNAP IN CONTACT (4)
STANDOFF
TERMINAL BOARD
CAPACITOR
RESISTORS TYPICAL
E0500
E0501
TERMINAL BLOCK MODULE (13)
(SEE NOTE 4)
TB501
TRACK
END
END RAIL
TERMINAL BLOCK MODULE (7)
END
MICROPHONE FILTER
TRACK
END RAIL

OBSERVER'S HEADSET JACK
(SEE NOTE 2)

PILOT'S (OR COPILOT'S) HEADSET JACK
(SEE NOTE 2)

TYPICAL RADIO RESISTOR ASSEMBLIES

TERMINAL BLOCK

HEADSET/MICROPHONE FILTER ASSEMBLY

NOTES:

1. MWO 55-1520-214-30/19 AND 30/28 CHANGES COILED HEADSET JACK CABLE TO A STRAIGHT CABLE CONFIGURATION WITHOUT SNAP-IN CONTACTS AND CHANGES THE HEADSET/ MICROPHONE FILTER ASSEMBLY.
2. COILED OR UNCOILED CABLES MAY BE INSTALLED.
3. SERIAL NO. 67-18127 AND SUBSEQUENT HAVE 24 TERMINALS ON TB-500.
4. USED ON SERIAL NO. 66-12116 THROUGH 67-18126 ONLY.

EL 1520-214-20-TM-2

Figure 1-12. Major installation items less antenna equipment.

CHAPTER 2
ORGANIZATIONAL MAINTENANCE

Section I. GENERAL REQUIREMENTS

2-1. Scope

Organizational maintenance requirements for the electronic configuration are listed below and referenced to paragraphs covering the specific maintenance functions. These specific maintenance procedures supplement the daily and periodic checks and services covered in the organizational maintenance manual for the aircraft (app. A). Perform the maintenance procedures in this manual concurrently with the periodic maintenance checks and services for the aircraft. Record inspection results on applicable maintenance forms in accordance with instructions in TM 38-750. Tools, materials, and test equipment required are listed in paragraph 2-2. Refer to chapter 4 for organizational maintenance information on ancillary equipment.

WARNING

> The BATT-OFF-EXT switch and GEN-OFF switch (fig. 2-1), located on the electrical control console assembly, are a part of the aircraft electrical system. Check that BATT-OFF-EXT switch and GEN-OFF switch are set to OFF before performing cleaning or removal and replacement procedures.

NOTES

> Applicable in-aircraft portions of the periodic checks and services chart (para 2-7) must be performed after installation of an equipment in the aircraft.

a. Periodic preventive maintenance checks and services and general requirements (paras 2-2 through 2-7).

b. General cleaning and repainting (para 2-8).

c. Troubleshooting (paras 2-9 and 2-10).

d. Removal and replacement (paras 2-11 through 2-42).

e. Adjustments after replacement (paras 2-43 through 2-45).

2-2. Tools, Materials, and Test Equipment Required

Lists of parts authorized for organizational maintenance of the electronic configuration in the aircraft appear in TM 11-1520-214-20P and TM 55-1520-214-20P. Major electronic components, when removed from the aircraft for higher category maintenance, are replaced by serviceable major electronic components from maintenance float stock or on a direct exchange (DX) basis from higher category maintenance organizations (direct support maintenance). Tools, materials, and test equipment required for organizational maintenance are listed below.

a. Tools.

(1) Toolkit, Electronic Equipment TK-100/G.

(2) Toolkit, Electronic Equipment TK-101/G.

(3) Multimeter AN/URM-105.

(4) Maintenance Kit MK-693A or equal to include—

> Insertion/Extraction Tool Burndy Part No. RXT20-5), and Crimning Tool (Burndy Part No. M10S) with Die-Set (Burndy Part No. S-5), and Stop Bushing (Burndy Part No. SL-26).

(5) Test Prod Kit (NSN 6625-00-678-0657).

b. Materials.

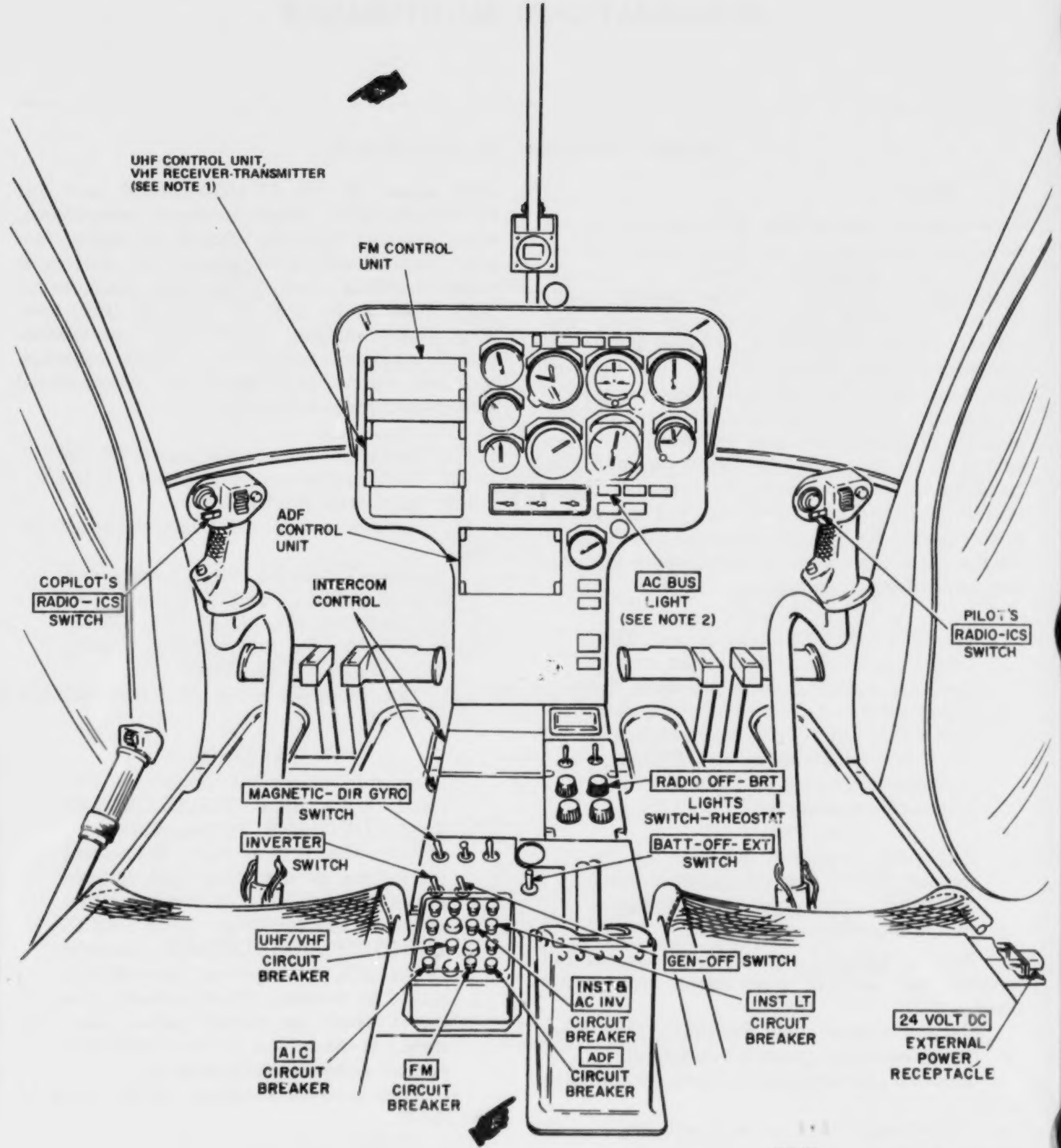
WARNING

> Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

(1) Trichlorotrifluoroethane (NSN 6850-00-984-5853).

(2) Distilled or deionized water.

(3) Cleaning solvent, Federal Specification P-D-680, type II.


UHF CONTROL UNIT,
VHF RECEIVER-TRANSMITTER
(SEE NOTE 1)
FM CONTROL UNIT
ADF CONTROL UNIT
COPILOT'S RADIO – ICS SWITCH
INTERCOM CONTROL
AC BUS LIGHT (SEE NOTE 2)
PILOT'S RADIO-ICS SWITCH
MAGNETIC- DIR GYRO SWITCH
RADIO OFF- BRT LIGHTS SWITCH-RHEOSTAT
INVERTER SWITCH
BATT-OFF- EXT SWITCH
UHF/VHF CIRCUIT BREAKER
GEN-OFF SWITCH
INST & AC INV CIRCUIT BREAKER
INST LT CIRCUIT BREAKER
24 VOLT DC EXTERNAL POWER RECEPTACLE
AIC CIRCUIT BREAKER
FM CIRCUIT BREAKER
ADF CIRCUIT BREAKER
EL10G013

NOTES:
1. UHF NORMAL, VHF ALTERNATE.
2. USED ONLY ON DOUBLE-INVERTER CONFIGURATIONS.

Figure 2-1. Flight compartment controls for electronic configuration.

(4) Fine sandpaper, No. 000.

(5) Fine sandpaper, No. 0000.

(6) Clean, dry, line free cloth.

(7) Brush, MIL-G-7241.

(8) Corrosion preventive compound MIL-C-16173.

(9) Soft bristle brush.

(10) Grease, aircraft and instrument (GL).

(11) Lens tissue paper.

(12) Safety wire, annealed corrosion resistant, steel, spool, 0.032 in.

(13) Tape (Part No. 471, 3M Company, Minneapolis, Minn.).

2-3. Fuse Locations

Fuses in the electronic configuration are not accessible without partial disassembly of the electronic components. Refer to the pertinent technical manuals (app. A) for fuse locations in the RT-348/ARC-54 (fig. 1-4). RT 742 (*)/ARC-51BX (fig. 1-2), and HD-615/ARC-51X. Fuses are not used in other components of the electronic configuration. Protective circuit breaker locations for the avionics equipment circuits are shown in figure 2-1. The circuit breaker circuit ratings are indicated in the following chart:

Panel marking	*Current rating (amperes)*
INST LT	7.5
UHF/VHF	15.0
AIC	7.5
FM	7.5
ADF	7.5
INSTL & AC INV	7.5

2-4. Auxiliary Power

Before performing periodic functional of operational checks or troubleshooting of the electronic configuration, connect an auxiliary power unit (Aircraft Ground Servicing Unit, Multipurpose, type MA-1, or equivalent) to the aircraft to prevent excessive current loads on the battery. An external power receptacle (AN 2552A3A) is installed on the aircraft for this purpose. The 24 VOLTS D.C. external power receptacle (fig. 2-1) is mounted under a cover located at the right-hand side of the pilot's seat. Access to the 24 VOLTS D.C. external power receptacle is obtained by opening the pilot's door on the right side of the aircraft. When closed, the pilot's door protects the exposed terminals of the receptacle. Coordinate connection of the auxiliary power unit to the aircraft with aircraft organizational maintenance personnel, or the aircraft crew chief, as appropriate. Make the connection as follows:

a. Set the BATT-OFF-EXT switch (fig. 2-1) to OFF.

CAUTION

The BATT-OFF-EXT switch must not be in the EXT position while the auxiliary power unit is being connected to the aircraft.

b. Open the pilot's door on right-hand side of aircraft for access to the 24 VOLTS D.C. external power receptacle. Connect the auxiliary power unit plug to the receptacle on the aircraft.

CAUTION

Reversed polarity between the aircraft electrical system and the auxiliary power unit can damage electrical parts. Only the two large terminals of the receptacle are used. The center terminal must be connected to the negative (−) line. The outside terminal must be connected to the positive (+) line.

c. Set the BATT-OFF-EXT switch to EXT.

Section II. PERIODIC PREVENTIVE MAINTENANCE

2-5. Preventive Maintenance

The following systematic servicing and inspection procedures are intended to minimize the possibility of equipment failure, to reduce aircraft downtime, and to obtain the best performance from each component. Preventive maintenance is the responsibility of all personnel concerned with the configuration and includes the repair or replacement of those components that the inspection procedures reveal as possible sources of trouble. Preventive maintenance checks and services of the aircraft at the organizational category are made at daily and periodic intervals (TM 55-1520-214-20-PMS) unless otherwise directed by the commanding officer. The following maintenance checks and services for the electronic configuration should be performed at the same time as the checks and services of the aircraft.

a. Maintenance Checks and Services. The maintenance checks and services procedures provided by this manual outline functions to be performed at specific intervals. These checks and services are performed to maintain the aircraft in combat readiness; that is to maintain the aircraft and its electronic configuration in good physical and functional condition. To assist the organizational maintenance repairman in maintaining combat readiness, the chart (para 2–7) indicates what to check, how to perform the check, and what the normal conditions are. The *References* column lists the paragraphs or publications that contain additional information. If a defect cannot be remedied by the organizational repairman, higher category maintenance or repair will be required.

b. Maintenance Forms and Records. The records and reports of these checks and services and the maintenance forms and records to be used and maintained on the electronic configuration are described in TM 38–750. Paragraph 1–3 contains additional information concerning the submission of specific forms.

2–6. Periodic Preventive Maintenance Checks and Services

a. General. The periodic preventive maintenance checks and services for all electronic equipment installed in the aircraft will be scheduled in accordance with the requirements of TM 38–750 and concurrently with the periodic maintenance and service inspection of the aircraft to reduce aircraft downtime to a minimum. All deficiencies or shortcomings will be immediately reported to a higher maintenance category by use of the forms and procedures specified in TM 38–750. Equipment that has a deficiency which cannot be corrected at the organizational maintenance category should be deadlined in accordance with TM 38–750. Perform all applicable services listed in the periodic preventive maintenance checks and services chart (para 2–7). Whenever a normal condition or result is not observed, perform corrective action in accordance with the paragraph listed in *References* column.

b. Periodic Pullout Inspection. During the inspection of the electronic configuration, the electronic equipment scheduled for pullout will be removed from the aircraft for bench tests, calibration, alignment, and inspections in accordance with the pertinent equipment technical manuals. These inspections are performed by direct support personnel. Except in the case of malfunctioning equipment, removal will be accomplished only during the aircraft periodic inspection. However, if the electronic equipment operating hours, as indicated in the chart in *c* below, do not coincide with the aircraft periodic inspection intervals, the equipment will normally be removed only if it has been in operation a minimum of 50 percent of its scheduled in-service operating hours. While the equipment is removed from the aircraft, the organizational repairman may perform the power-off inspection of the configuration (para 2–7, sequence Nos. 2 through 16). Upon completion of the bench tests and inspection, the organizational repairman will install the electronic equipment, perform all the necessary adjustments (paras 2–43 through 2–45), and perform the operational checks (para 2–7, sequence Nos. 17 through 55).

c. Operating Hours Chart.

The requirement for periodic pullout intervals has been deleted.

Equipment	Number of hours
Uhf Radio Set (AN/ARC–51BX):	
Uhf receiver-transmitter (RT–742(*)/ARC–51BX).	
Uhf control unit (C–6287/ARC–51BX).	
Uhf radio set mounting (MT–2653/ARC).	
External blower (HD–615/ARC–51X).	
Reflectometer (ID–1003/ARC) ..	
Vhf radio set (AN/ARC–111) *:	
Vhf receiver-transmitter (RT–802/ARC–111).	
Amplifier-power supply (AM–4489/ARC–111).	
Vhf amplifier-power supply mounting (MT–3592/ARC).	
Fm radio set (AN/ARC–54):	
Fm receiver-transmitter (RT–348/ARC–54).	
Fm control unit (C–3835/ARC–54).	
Fm radio set mounting (MT–1535/ARC–54).	
Direction finder set (AN/ARN–83 less MT–3605/ARN–83).	
Adf receiver (R–1391/ARN–83)	
Adf control unit (C–6899/ARN–83).	
Adf fixed loop antenna (AS–863/ARN–83).	
Dc-to-ac inverter (CU–2128/ARN–83).	
Adf receiver mounting	

Equipment	Number of hours
Gyromagnetic compass set (AN/ASN-43).	
Compass transmitter (T-611/ASN).	
Compensator (CN-405/ASN)	
Directional gyro (CN-998/ASN-43).	
Intercom control (C-1611(*)/AIC)	
Homing, heading, and bearing indicator (ID-1351/A).	
Static inverter	
Aircraft battery	(See TM 11-6140-203-15-2)
Waveshape filter[b]	

[a] Alternate for uhf radio set.

[b] Part of static inverter in some aircraft.

2-7. Periodic Preventive Maintenance Checks and Services Chart

NOTE

The checks and procedures in the following chart apply to all aircraft, unless otherwise indicated.

Sequence No.	Item	Procedure	References
		POWER-OFF INSPECTION	
1	Entire configuration	Remove all electronic equipment scheduled for bench tests.	Paras 2-11 through 2-42.
2	Publications	Check to see that pertinent publications are available and complete (all changes incorporated).	App A and DA Pam 310-4.
3	Modification work orders	Check DA Pam 310-7 to determine if new applicable MWO's have been published. Check to see that all URGENT MWO's have been applied to the equipment, and all NORMAL MWO's have been scheduled.	DA Pam 310-7.
4	Frequency cards, decals, stencils, and other insignia.	*a.* Check for current frequency cards in frequency card holders.	None.
		b. Check all decals, stencils, and insignia for legibility.	None.
5	Headset-jacks	Check headset jacks (fig. 1-12) and associated headset-microphones for damage; check for dirt, cuts, breaks, and improper connections.	Para 2-32.
6	Copilot's foot switch	Check copilot's foot switch for smooth, positive action.	Para 2-36.
7	Observer's foot switch	Check observer's foot switch for smooth, positive action.	Para 2-37.
8	Control panels and operating controls.	*a.* Check control panels for dirt and scratched or marked paint. *b.* Check knobs for looseness or binding; adjust as necessary. Check switches for positive action and loose mounting.	Para 2-8.
9	Connector plugs and receptacles	Inspect connector plugs and receptacles for cracks, corrosion, bent connector pins, or signs of overheating.	None.
10	Cables and wiring	Inspect cables and wiring for chafing, fraying, overheating, and loose terminal block contacts.	Para 2-41.
11	Terminal blocks, terminal board, and radio resistor assemblies.	Inspect terminal blocks, terminal board, and radio resistor assembly (fig. 1-12) for loose connections, and structural soundness.	Para 2-8.
12	Equipment mountings	Check major components (fig. 1-1) for loose mountings; check shock-mounts for resiliency.	Paras 2-11 through 2-42.
13	Antennas	Inspect all antennas as follows:	
		a. Inspect aft end of adf sense antenna for loose mounting bolt or missing cotter pin at clip on boom assembly.	Para 2-26.

Sequence No.	Item	Procedure	Reference
		b. Inspect rubber tension unit, thimbles, hooks, and attaching parts of adf sense antenna on tail boom for damage, corrosion, or deterioration.	Para 2-26.
		c. Inspect adf sense antenna improved tension unit for cracks or fractures.	Para 2-26.
		d. Check stud and terminal connections for adf sense antenna (fig. 1-11) at upper right rear of engine air inlet fairing, for loose connections.	Paras 2-16 and 2-26.
		e. Check that forward lead of adf sense antenna is securely taped to inside of upper right corner of engine air inlet fairing.	Para 2-26.
		f. Check bracket and leads of uhf/vhf antenna inside engine air inlet fairing for loose connections, corrosion, and possible damage.	Paras 2-16 and 2-26.
		g. Check fm homing antenna for cuts, breaks, or separation of foil tape from canopy.	Para 2-21.
		h. Inspect light and loop antenna cover for damage that would indicate possible defective fixed loop antenna.	Para 2-24.
14	Antenna coupling and matching units (fig. 1-9).	Inspect all antenna couplings and matching units as follows:	
		a. Inspect uhf/vhf matching unit for security to bracket inside engine inlet aft fairing installation. Inspect uhf/vhf antenna cable for loose connection.	Para 2-16.
		b. Inspect fm homing transformers for loose mounting on canopy frame. Inspect cables for loose connections.	Para 2-21.
		c. Inspect fm antenna coupler and hybrid network for loose mounting. Inspect cables for loose connections. Check fm antenna lead-in and terminals for corrosion and loose connections. Inspect lower and upper fm antenna jumpers for shorting to aircraft structure.	Para 2-19.
15	Inverters (figs. 1-1 and 1-5).......	Inspect dc-to-ac inverter(s) for loose mounting, corrosion on terminals, and loose terminal connections.	Paras 2-25 and 4-5.
16	Equipment replacement............	*a*. Replace all units of electronic configuration removed for bench testing.	Paras 2-11 through 2-42.
		b. Perform all necessary adjustments of reinstalled units.	Paras 2-43 through 2-45.
		OPERATIONAL PRESET	
17	Auxiliary power unit................	Connect an auxiliary power unit to the 24 VOLTS D.C. external power receptacle (fig. 2-1).	Para 2-4.
18	BATT-OFF-EXT switch (fig. 2.1	Set aircraft BATT-OFF-EXT switch to EXT. To prevent engine-out warning signal from sounding in headsets; place GEN-OFF switch to OFF.	None
		OPERATIONAL CHECK, INTERPHONE FACILITY	
19	INST LT circuit breaker and RADIO lights switch-rheostat (fig. 2-1).	*a*. INST LT circuit breaker must be on (depressed).	Para 2-10, sequence No. 1*a*.
		b. Rotate RADIO lights switch-rheostat throughout its range and check all control unit panel lights for full range of brightness.	

Sequence No.	Item	Procedure	References
20	AIC circuit breaker (fig. 2–1)	AIC circuit breaker must be on (depressed)	Para 2–10, sequence No. 2.
21	Pilot's, copilot's and observer's intercom controls (fig. 1–7).	*a.* RECEIVERS switches 1, 2, 3, and 4 and NAV switch off (down); INT switch to ON (up).	None.
		b. Transmit-interphone selector switch at INT.	None.
		c. Turn VOL controls until a rushing noise is heard in the pilot's, copilot's, and observer's headsets.	Para 2–10, sequence No. 3.
22	Pilot's RADIO–ICS switch (fig. 2–1) and headset-microphones.	Depress pilot's RADIO–ICS switch to ICS position and listen for sidetone in pilot's headset. Speak into microphone and listen for signals in copilot's and observer's headsets.	Para 2–10, sequence No. 4.
23	Copilot's RADIO–ICS switch (fig. 2–1), copilot's foot switch (fig. 1–1) and headset microphone.	Depress copilot's RADIO–ICS switch to ICS position and listen for sidetone in copilot's headset. Speak into microphone and listen for signal in pilot's headset. Repeat procedure, depressing copilot's foot switch in place of RADIO–ICS switch.	Para 2–10, sequence No. 4.
24	Observer's headset switch-jack and headset-microphone (fig. 1–12).	Depress switch on observer's headset switch-jack and listen for sidetone. Speak into microphone and listen for signal in pilot's and copilot's headsets. Repeat procedure, depressing observer's foot switch.	Para 2–10, sequence No. 4.
25	Intercom controls (fig. 1–7) (hot-mike operation).	Set pilot's transmit-interphone selector switch to PVT. Speak into pilot's microphone and listen for signals in copilot's and observer's headset. Repeat procedure, setting copilot's transmit-interphone selector switch to PVT. Repeat procedure, setting observer's selector switch to PVT. Communication between all stations should be possible.	Para 2–10, sequence No. 5.
		OPERATIONAL CHECK UHF FACILITY	
26	UHF/VHF circuit breaker (fig. 2–1).	UHF/VHF circuit breaker must be on (depressed).	Para 2–10, sequence No. 6.
27	Intercom controls (fig. 1–7)	*a.* Set transmit-interphone selector switch at 2.	None.
		b. Place RECEIVERS switch No. 2 at ON.	None.
28	Uhf control unit (fig. 1–2)	*a.* Set function selector switch at T/R	None.
		b. Set MC control to unused frequency. Listen to headset while operating SQ DISABLE switch ON and OFF. Background noise is heard only when SQ DISABLE switch is ON.	Para 2–10, sequence No. 8*b*.
		c. Set mode selector to PRESET CHAN position. Set preset channel control to a preset channel known to be in use and listen for signals.	None.
		d. Turn VOL control and listen for erratic signal variations that may indicate channels not properly preset or defective VOL control.	Para 2–10, sequence No. 8*d* or 9.
		e. Set SQ DISABLE switch to ON. Received audio signals are not affected.	Para 2–10, sequence No. 8*b*.

Sequence No.	Item	Procedure	References
29	Pilot's RADIO-ICS switch (fig. 2-1).	Depress pilot's RADIO-ICS switch to RADIO and establish communications with uhf station. Transmitted signals are of adequate strength and clarity. Sidetone signals and received signals are clear and adequate to maintain reliable communications. Release RADIO-ICS switch.	Para 2-10, sequence No. 8.
30	Uhf control unit (fig. 1-2)	*a.* Set function selector switch at T/R+G. *b.* Verify proper operation on guard channel.	None. Para 2-10, sequence No. 8.
31	Uhf control unit (fig. 1-2)	Set function selector switch at OFF	None.
		OPERATIONAL CHECK VHF FACILITY	
32	UHF/VHF circuit breaker (fig. 2-1).	UHF/VHF circuit breaker, must be on (depressed).	Para 2-10, sequence No. 9.
33	Intercom controls (fig. 1-7)	*a.* Set RECEIVERS switch 3 at ON *b.* Set transmit-interphone switch at 3	None. None.
34	Vhf receiver-transmitter (fig. 1-3).	*a.* Set OFF-PWR switch (fig. 1-3) at PWR. *b.* Set frequency controls to a frequency monitored by vhf facility (local vhf station). *c.* Listen for signals from local vhf station in pilot's, copilot's and observer's headsets. *d.* Turn VOLUME control (fig. 1-3), listen for erratic breaking of signal that may indicate defective control. Reset control to comfortable level. *e.* Adjust SQUELCH control (fig. 1-3) until background noise just drops out. Reset control until background noise is just heard. ***Caution:*** Ensure that the OFF-PWR switch (fig. 1-3) has been in the PWR position for at least 30 seconds.	Para 2-10, sequence No. 10.
35	Pilot's RADIO-ICS switch (fig. 2-1).	Depress pilot's RADIO-ICS switch to RADIO; establish communication with vhf ground station. Insure that transmitted signals are of adequate strength and clarity. Release RADIO-ICS switch.	Para 2-10, sequence No. 11.
36	Vhf receiver-transmitter (fig. 1-3).	Set OFF-PWR switch (fig. 1-3), to OFF	None.
		OPERATIONAL CHECK, FM FACILITY	
37	FM circuit breaker (fig. 2-1)	FM circuit breaker must be on (depressed).	Para 2-10, sequence No. 12.
38	Intercom controls (fig. 1-7)	Set RECEIVERS switch 1 at ON and transmit-interphone selector switch at 1.	None.
39	FM control unit (fig. 1-4)	*a.* Set mode control switch at PTT *b.* Set SQUELCH control switch to CARR. *c.* Set frequency controls to a frequency of local fm station.	None. None. None.

Sequence No.	Item	Procedure	References
		d. Listen for signals from the local fm station in pilot's, copilot's, or observer's headsets.	Para 2-10, sequence No. 13.
		e. Turn VOL control and listen for erratic breaking of signal that may indicate a defective VOL control. Reset VOL control to comfortable level. Set SQUELCH control switch at DIS and listen for rushing noise in headset. Return DIS-CARR-TONE switch to CARR.	None.
40	RADIO-ICS switch (fig. 2-1)	Depress RADIO-ICS switch to RADIO position; establish communications with fm station. Ensure that transmitted signals are of adequate strength and clarity and received signals are clear and adequate to maintain reliable communication. Release RADIO-ICS switch.	Para 2-10, sequence No. 14.
41	FM control unit (fig. 1-4)	If distance and similar conditions will permit sure and accurate verification of fm homing facility, verify operation as follows: *a.* Set mode control switch at HOME. *b.* Adjust frequency control to frequency of local fm station.	None.
42	Homing, heading, and bearing indicator (figure 1-8).	Observe steering meter (homing needle) on homing, heading, and bearing indicator; observe that steering meter indicates relative bearing of fm station and does not oscillate.	Para 2-10, sequence No. 15.
43	FM control unit (figure 1-4)	Set mode control switch at OFF.	
		OPERATIONAL CHECK, HEADING REFERENCE FACILITY	
44	INST & AC INV circuit breaker; INVERTER 1-2-OFF and MAGNETIC-DIR GYRO switches (fig. 2-1); and homing, heading, and bearing indicator (fig. 1-8).	INST & AC INV circuit breaker (fig. 2-1) must be on (depressed). Place INVERTER switch at 1 and MAGNETIC-DIR GYRO switch at MAGNETIC. Observe that the power failure meter (indicator) (fig. 1-8) disappears.	Para 2-10, sequence No. 16.
45	Homing, heading, and bearing indicator (fig. 1-8).	Turn synchronizing knob in direction indicated by annunciator until annunciator is centered (nulled). Observe scale dial and verify correct heading of aircraft from magnetic north, within 2 degrees.	Para 2-10, sequence No. 16.
46	MAGNETIC-DIR GYRO switch (fig. 2-1).	Place MAGNETIC-DIR GYRO switch at DIR GYRO.	None.
47	Directional gyro (fig. 1-6)	Place LATITUDE switch at N for northern hemisphere operation or at S for southern hemisphere operation; set LATITUDE control to local latitude.	None.
48	Homing, heading, and bearing indicator (fig. 1-8).	Rotate synchronizing knob to set scale dial to a known heading reference. Check to see that associated annunciator moves to center position and then does not change. Observe scale dial and verify that correct heading of aircraft is indicated.	Para 2-10, sequence No. 17.

Sequence No.	Item	Procedure	References
49	Directional gyro (fig. 1-6)	Insure that LATITUDE switch and LATITUDE control are at correct operational position and setting.	None.
		OPERATIONAL CHECK, DIRECTION FINDING FACILITY	
50	ADF circuit breaker (fig. 2-1)	ADF circuit breaker must be on (depressed).	Para 2-10, sequence No. 18.
51	Intercom control units (fig. 1-7)	Set pilot's, copilot's and observer's intercom control units as follows: *a.* RECEIVERS switches off (down) and NAV switch at ON. *b.* VOL control at midrange.	None.
52	Adf control unit (fig. 1-5) ANT operation.	Set adf control unit as follows: *a.* BFO-OFF switch (fig. 1-5) at BFO, if tuning to cw station. BFO may also be used as tuning aid when tuning for am (low frequency range or standard broadcast) station. *b.* OFF-ADF-ANT-LOOP switch (fig. 1-5), to ANT. *c.* Range switch (fig. 1-5), to desired range.	
		d. Turn TUNE control (fig. 1-5), to desired frequency; tune for maximum indication on the tuning meter. *e.* Adjust GAIN control (fig. 1-5), for desired audio level in pilot's headset.	Para 2-10, sequence No. 19.
53	Adf control unit (fig. 1-5) ADF operation.	*a.* Perform procedure in sequence No. 52; then set OFF-ADF-ANT- LOOP switch (fig. 1-5) at ADF.	None.
		b. Observe and note bearing indication on homing, heading, and bearing indicator; rotate LOOP switch (fig. 1-5) to R (right) or L (left) position until radio pointer deviates 10 or 20 degrees from original reading. *c.* Release LOOP switch (fig. 1-5) and observe bearing indicator. Radio pointer should return to indicate original relative bearing of station.	Para 2-10, sequence No. 20.
54	Adf control unit (fig. 1-5)	Perform sequence No. 53 on other low-frequency stations in area.	Para 2-10, sequence No. 20.
55	Adf control unit (fig. 1-5), Loop operation.	*a.* Perform procedures in sequence Nos. 53 and 54. When LOOP switch has moved radio pointer 10 or 20 degrees, set OFF-ADF-ANT-LOOP switch (fig. 1-5), to LOOP. *b.* Set BFO-OFF switch (fig. 1-5) to BFO. A slight whistle will be heard in headset. *c.* Adjust TUNE control (fig. 1-5), left and right to obtain zero beat. *d.* Use LOOP switch (fig. 1-5) to obtain signal null in headset. Radio pointer will indicate relative bearing of station (or will indicate 180 degrees from bearing of station). *e.* Set BFO-OFF switch (fig. 1-5) to OFF.	Para 2-10, sequence No. 20.

Sequence No.	Item	Procedure	References
56	ADF control unit (fig. 1–5)	Set OFF–ADF–ANT–LOOP switch (fig. 1–5) to OFF.	
		POST OPERATIONAL SHUTDOWN	
57	RADIO lights switch-rheostat (fig. 2–1).	Rotate RADIO lights switch-rheostat fully counterclockwise to OFF. Instrument lights on control units are deenergized.	None.
58	BATT–OFF–EXT switch (fig. 2–1).	Set BATT–OFF–EXT switch (fig. 2–1) to OFF; power to aircraft 28-vdc bus is disconnected.	None.
59	Auxiliary power unit	Disconnect auxiliary power unit from 24 volts D.C. external power receptacle (fig. 2–1).	None.

2-8. General Cleaning and Repainting

a. Cleaning. Exterior surfaces of configuration equipment should be clean and free of dust, dirt, grease, oil, fungus, and corrosion. Perform the following cleaning procedures as specified in the preventive maintenance checks and services chart (para 2-7).

(1) Remove moisture and loose dirt with a clean, dry, lint free cloth.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

(2) Remove grease, fungus, and ground-in dirt from the exterior surfaces with a clean cloth dampened (not wet) with trichlorotrifluoroethane. Wipe dry with a clean, dry, lint free cloth.

CAUTION

If an air jet is used, do not direct the compressed air nozzle toward the RF wattmeter on the reflectometer of the uhf receiver-transmitter, or damage to equipment may result.

(3) Remove dust or dirt from all exposed cable connectors with a brush, or an air jet, if a compressed air source is available. Use clean, dry compressed air at a pressure of 25 to 28 pounds per square inch (psi). Remove moisture with a dry cloth. If necessary, use cleaning solvent; apply cleaning solvent sparingly with a small camel's hair brush. Do not allow the cleaning solvent to flow into sleeves or conduit covering any wire connected to the contacts of connectors.

(4) Clean all front panels of control units using a soft, clean cloth. If necessary, moisten the cloth with water, or use water and mild soap.

(5) Clean the exterior of excessively dirty filters and filter pads by brushing off loose dirt with a dry brush; use a vacuum cleaner, if available.

(6) Wipe lens surfaces on tuning dials, meters, and indicators clean with a lint free cloth moistened (not wet) with cleaning compound. Wipe dry and polish with fine lens tissue paper.

b. Preservation. Remove rust and corrosion from metal surfaces by lightly sanding with fine sandpaper, No. 000 or 0000. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213 and TB 746-10.

Section III. TROUBLESHOOTING

2-9. General Troubleshooting Information

Troubleshooting of the aircraft electronic configuration is based on the checks in the periodic preventive maintenance checks and services chart (para 2-7). To troubleshoot the equipment, perform all functions starting with sequence No. 20 of paragraph 2-7, the periodic preventive maintenance checks and services chart. Proceed through the items until an abnormal condition is observed. When an abnormal condition is observed and additional troubleshooting is required, perform the referenced troubleshooting procedures in paragraph 2-10. A detailed interconnecting wiring diagram for the configuration is provided in chapter 5. This diagram will assist the organizational repairman in troubleshooting an inoperative or malfunctioning facility. The electronics configuration contains transistorized equipment and appropriate precautions are required to prevent damage to those equipments during any measurements performed. The direction finder set (AN/ARN-83), the associated dc-to-ac inverter on the adf receiver mounting, and the amplifier-power supply of the vhf radio set (AN/ARC-111) are transistorized. If the corrective measures indicated do not result in correction of the trouble, higher category maintenance is required. Paragraphs 2-11 through 2-42 contain step-by-step instructions for performing equipment removal and replacement; paragraphs 2-43 through 2-45 contain adjustments procedures to be performed after the equipment is installed in the aircraft.

CAUTION

Before using an ohmmeter to test transistorized equipment, check the open circuit voltage across the ohmmeter test leads. Do not use the ohmmeter if the open circuit voltage exceeds 1.5 volt. Since the R x 1 range normally connects the internal battery in the ohmmeter directly across the test leads, excessively high current may ruin some transistors. For a safe current that will not damage transistors use the R x 100 range of Multimeter TS-352/U. Use all precautions to avoid transistor damage.

2-10. Troubleshooting Chart

NOTE

To perform troubleshooting of the aircraft electronic configuration, use the following chart in conjunction with periodic maintenance checks and services chart (para 2-7).

Sequence No.	Symptom	Probable trouble	Correction
1	*a.* INST LT circuit breaker (fig. 2-1) does not stay on (depressed) when RADIO switch-rheostat is turned to BRT.	*a.* Short circuit in one or more control units.	*a.* Check for short circuit by replacement of units in the following order: (1) Pilot's intercom control (para 2-12). (2) Copilot's intercom control (para 2-12). (3) Observer's intercom control (para 2-13). (4) Fm control unit (para 2-12). (5) Adf control unit (para 2-12). (6) Uhf control unit (para 2-12). (7) Vhf receiver-transmitter.
	b. One or more panel lights in the control units do not come on.	*b.* Defective: (1) Lamp (2) Defective control unit	*b.* Replace: (1) Lamp (para 2-35). (2) Replace control unit (para 2-12).
2	AIC circuit breaker (fig. 2-1) does not stay depressed but trips immediately.	Short circuit in interphone facility.	Check for short circuit by substitution of intercom control units (para 2-12).
3	No rushing noise in headset when interphone facility is energized.	*a.* Faulty terminal block connection in headset-microphone filter assembly.	*a.* Check connection and correct as required (para 2-40).
		b. Headset-jack defective	*b.* Replace headset-jack (para 2-32).
		c. Headset-microphone defective	*c.* Replace headset-microphone.
		d. Intercom control defective	*d.* Replace intercom control (para 2-12).
4	No sidetone in headset when pilot's RADIO-ICS switch (fig. 2-1) is in ICS position.	*a.* Intercom control defective	*a.* Replace intercom control (para 2-12).
		b. Microphone filter defective	*b.* Replace microphone filter (para 2-34).

Sequence No.	Symptom	Probable trouble	Correction
5	Interphone facility will not operate in PVT (hot-mike) mode.	Intercom control defective	Replace intercom control (para 2-12).
6	UHF/VHF circuit breaker (fig. 2-1) does not stay on (depressed) during uhf operation.	Short circuit in uhf facility	Check for short circuit by replacement of units in following order: *a.* Uhf control unit (para 2-12). *b.* Uhf receiver-transmitter (para 2-11).
7	*b.* SQ DISABLE switch (fig. 1-2) does not control squelch. *d.* VOL control (fig. 1-2) erratic.	*b.* Defective uhf control unit *d.* Defective uhf control unit	*b.* Replace uhf control unit (para 2-12). *d.* Replace uhf control unit (para 2-12).
8	Uhf facility does not operate properly (headset-microphone operates correctly in sequence Nos. 22, 23, and 24).	*a.* Channels not properly preset *b.* Guard channel improperly tuned. *c.* Defective uhf control unit *d.* Defective uhf receiver-transmitter.	*a.* Preset channels (para 2-45). *b.* Replace uhf receiver-transmitter (para 2-11). *c.* Replace uhf control unit (para 2-12). *d.* Replace uhf receiver-transmitter (para 2-11).
9	UHF/VHF circuit breaker (fig. 2-1) does not stay on (depressed) during vhf operation.	Short circuit in vhf facility	Check for short circuit by replacement of units in following sequence: *a.* Vhf receiver-transmitter (para 2-12). *b.* Amplifier-power supply (para 2-17).
10	Cannot receive vhf signals, (Headset-microphones operate correctly in sequence Nos. 22, 23, and 24, para 2-7.)	*a.* Defective vhf receiver-transmitter. *b.* Defective amplifier-power supply. *c.* Defective uhf/vhf matching unit. *d.* Defective or disconnected lead-in from uhf/vhf matching unit, or rf cable from uhf/vhf matching unit to vhf receiver-transmitter.	*a.* Replace vhf receiver-transmitter (para 2-12). *b.* Replace amplifier-power supply (para 2-17). *c.* Replace uhf/vhf matching unit (para 2-16). *d.* Check for secure connections.
11	Cannot transmit to vhf ground station, (Headset-microphones check correctly in sequence Nos. 22, 23, and 24, para 2-7).	*a.* Defective receiver-transmitter. *b.* Defective amplifier-power supply.	*a.* Replace vhf receiver-transmitter (para 2-12). *b.* Replace amplifier-power supply (para 2-17).
12	FM circuit breaker (fig. 2-1) does not stay on (depressed).	Short circuit in fm facility	Check for short circuit by replacement of units in following order: *a.* Fm control unit (para 2-12). *b.* Fm receiver-transmitter (para 2-18).
13	No received signals from fm station. (Headset-microphone operates correctly.)	*a.* 27.5-volt power not being supplied to fm facility. *b.* Defective fm control unit *c.* Defective fm receiver-transmitter. *d.* Defective fm antenna coupler.	*a.* Check connection to fm receiver-transmitter. *b.* Replace fm control unit (para 2-12). *c.* Replace fm receiver-transmitter (para 2-18). *d.* Replace fm antenna coupler (para 2-19).
14	Cannot transmit to fm station. (Headset-microphone operates correctly.)	*a.* Defective fm receiver-transmitter. *b.* Defective fm antenna coupler.	*a.* Replace fm receiver-transmitter (para 2-18). *b.* Replace fm antenna coupler (para 2-19).

Sequence No.	Symptom	Probable trouble	Correction
15	Steering meter (homing indicator) (fig. 1–8) on homing, heading, and bearing indicator does not work.	*a.* Defective connection between homing, heading, and bearing indicator, through fm control unit, to fm receiver-transmitter. *b.* Defective homing, heading, and bearing indicator. *c.* Defective fm control unit *d.* Defective fm receiver-transmitter.	*a.* Check connectors for security. *b.* Replace homing, heading, and bearing indicator (para 2–31). *c.* Replace fm control unit (para 2–12). *d.* Replace fm receiver-transmitter (para 2–18).
16	Power failure meter (indicator) (fig. 1–8) does not disappear on homing, heading, and bearing indicator.	*a.* Defective homing, heading, and bearing indicator. *b.* Defective static inverter *c.* Defective waveshape filter	*a.* Replace homing, heading and bearing indicator (para 2–31). *b.* Replace defective static inverter (para 4–5). *c.* Replace waveshape unit (para 4–11).
	a. Annunciator (fig. 1–8) can be adjusted to null, but scale dial does not move, on homing, heading, and bearing indicator.	*a.* Defective: (1) Homing, heading, and bearing indicator. (2) Directional gyro	*a.* Replace— (1) Homing, heading, and bearing indicator (para 2–31). (2) Directional gyro (para 2–27).
	b. Annunciator and scale dial move, but final heading shown by scale dial is incorrect.	*b.* Defective: (1) Directional gyro (2) Homing, heading, and bearing indicator. (3) Compass transmitter (4) Compensator (5) Slaving switch	*b.* Replace— (1) Directional gyro (para 2–27). (2) Homing, heading, and bearing indicator (para 2–31). (3) Compass transmitter (para 2–29). (4) Compensator (para 2–28). (5) Slaving switch (para 2–30).
17	Annunciator (fig. 1–8) does not go to center position (null) and remain at center, or scale dial does not move on homing, heading, and bearing indicator.	*a.* Defective homing, heading, and bearing indicator. *b.* Defective directional gyro	*a.* Replace homing, heading, and bearing indicator (para 2–31). *b.* Replace directional gyro (para 2–27).
18	ADF circuit breaker (fig. 2–1) will not stay on (depressed).	Short circuit in adf facility	Check for short circuit by replacement of units in the following order: *a.* Adf receiver (para (2–23). *b.* Dc-to-ac inverter (serial Nos. 65–12918 through 67–16326) (para 2–27). *c.* Adf control unit (para 2–12). *d.* Adf fixed loop antenna (para 2–24).
19	Cannot tune low frequency stations.	*a.* Defective adf control unit *b.* Defective adf receiver	*a.* Replace adf control unit (para 2–12). *b.* Replace adf receiver (para 2–23).
20	*a.* Tuning meter inoperative but receiver signal varies and able to tune different stations with adf control unit.	*a.* Defective: (1) Tuning meter in adf control unit. (2) Adf receiver	*a.* Replace— (1) Adf control unit (para 2–12). (2) Adf receiver (para 2–23).

Sequence No.	Symptom	Probable trouble	Correction
	b. Adf receiver insensitive	*b.* Defective:	*b.* Replace—
		(1) Connection between adf sense antenna, adf loop antenna, and the adf receiver.	(1) Check connections for security of connections to adf antennas and the adf receiver.
		(2) Adf receiver	(2) Replace adf receiver (para 2-23).
	c. Radio pointer (bearing indicator) of homing, heading, and bearing indicator not operating.	*c.* Defective:	*c.* Perform the following:
		(1) Connection between homing, heading, and bearing indicator and adf receiver.	(1) Check connector on homing, heading, and bearing indicator for security of connection; check connections from homing, heading, and bearing indicator to adf receiver.
		(2) Homing, heading, and bearing indicator.	(2) Homing, heading, and bearing indicator (para 2-31).
		(3) Adf receiver	(3) Adf receiver (para 2-23).
		(4) Defective dc-to-ac inverter	(4) Replace dc-to-ac inverter (para 2-25).
	d. Incorrect bearing indication	*d.* Defective:	*d.* Perform the following:
		(1) Connection between adf fixed loop antenna and adf receiver.	(1) Check circuit connections between adf fixed loop antenna and adf receiver.
		(2) Adf control unit	(2) Replace adf control unit (para 2-12).
		(3) Adf fixed loop antenna	(3) Replace adf fixed loop antenna (para 2-24).

Section IV. REMOVAL AND REPLACEMENT INSTRUCTIONS

CAUTION

Insure the BATT-OFF-EXT switch (fig. 2-1) and the GEN-OFF switch (part of the aircraft electrical system) are set to OFF before removing or replacing basic electronic components or installation items.

NOTE

When the removal or replacement of any basic electronic component or installation item requires the disassembly or reassembly of any portion of the aircraft, be sure to coordinate removal or replacement with aircraft organizational maintenance personnel, or the aircraft crew chief as appropriate. Removal and replacement of the fm communications and uhf/vhf antennas (figs. 1-9 and 1-11) requires removal and replacement of structural members of the aircraft by higher category airframe maintenance personnel.

2-11. Removal and Replacement of Uhf Receiver-Transmitter

(figs. 2-2 and 2-3)

Before removal and replacement of the uhf receiver-transmitter is performed, the pilot's tail rotor control pedals and the right hand floor compartment access door in the pilot's compartment must be removed. This is required for access to the uhf receiver-transmitter in the lower section electronic compartment.

a. Removal of Pilot's Pedals and Right-Hand Floor Access Door (fig. 2-2).

(1) Note the opening in each rudder pedal (A, fig. 2-2) in which the pedal arms are installed.

(2) Pull the two pins from the two rudder pedal arms and remove the two pedals.

(3) Depress the latch and raise the compartment access door from the latched position.

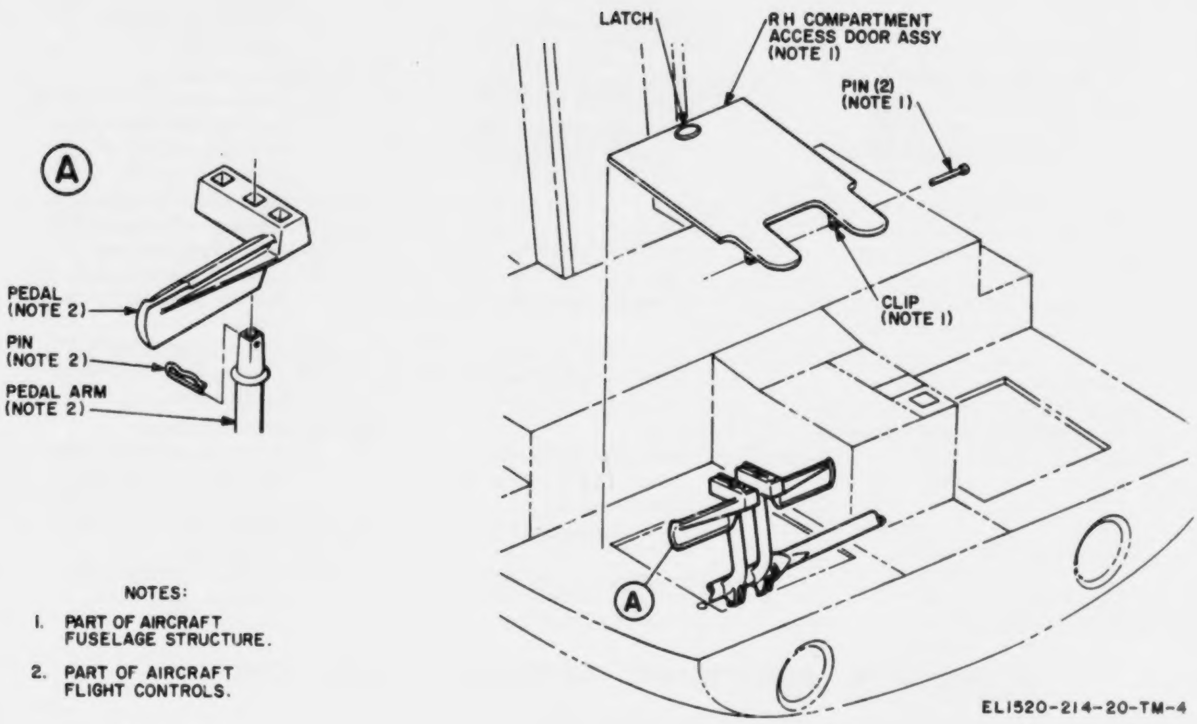

LATCH
R H COMPARTMENT ACCESS DOOR ASSY (NOTE 1)
PIN (2) (NOTE 1)
CLIP (NOTE 1)
A
PEDAL (NOTE 2)
PIN (NOTE 2)
PEDAL ARM (NOTE 2)
A
NOTES:
1. PART OF AIRCRAFT FUSELAGE STRUCTURE.
2. PART OF AIRCRAFT FLIGHT CONTROLS.
EL1520-214-20-TM-4

Figure 2-2. Electronics compartment accessibility.

(4) Locate the two pins that attach the front of the compartment access door assembly to the aircraft fuselage structure. Pull out and remove the two pins from the clips on the underside of the footrests of the compartment access door assembly.

(5) Remove the compartment access door assembly.

b. Removal of Uhf Receiver Transmitter (fig. 2-3).

(1) Disconnect the antenna and power control cables from the uhf receiver-transmitter.

(2) Cut and remove the safety wires from the wingnut fasteners on the uhf radio set mounting with a pair of diagonal pliers. Loosen and swivel the two wingnut fasteners upward to disengage the latches on the uhf radio set mounting.

(3) Grasp both handles on the dust cover of the uhf receiver-transmitter and slide the uhf receiver-transmitter off the uhf radio set mounting.

(4) Lift and remove the uhf receiver-transmitter from the access opening in the floor of the pilot's compartment.

c. Replacement of the Uhf Receiver-Transmitter (fig. 2-3).

(1) Lower the uhf receiver-transmitter through the access opening in the floor of the pilot's compartment and slide the uhf receiver-transmitter into the uhf radio set mounting.

(2) Swivel the wingnut fasteners downward to engage the latches on the uhf radio set mounting. Tighten the wignut fasteners and secure the safety wires between the mounting and each wingnut fastener.

(3) Connect the antenna and power control cables.

d. Replacement of Pilot's Right-Hand Floor Access Door Assembly and Pedals (fig. 2-2).

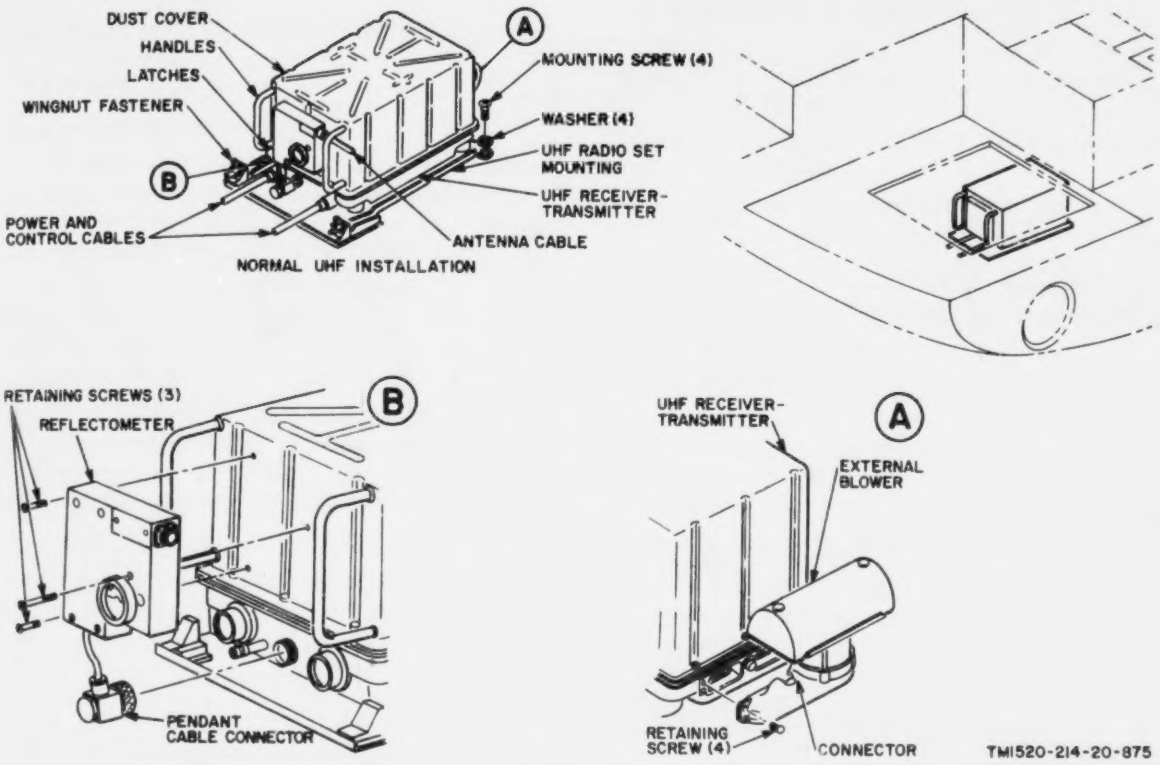

DUST COVER
HANDLES
LATCHES
WINGNUT FASTENER
A
MOUNTING SCREW (4)
WASHER (4)
UHF RADIO SET MOUNTING
UHF RECEIVER-TRANSMITTER
B
POWER AND CONTROL CABLES
ANTENNA CABLE
NORMAL UHF INSTALLATION
RETAINING SCREWS (3)
REFLECTOMETER
B
PENDANT CABLE CONNECTOR
UHF RECEIVER-TRANSMITTER
A
EXTERNAL BLOWER
RETAINING SCREW (4)
CONNECTOR
TM1520-214-20-875

Figure 2-3. Installation of uhf receiver-transmitter.

(1) Lower and place the compartment access door assembly in mounting position in the access opening of the floor in the pilot's compartment.

(2) Attach the front of the compartment access door assembly to the aircraft fuselage structure.

(3) Depress the compartment access door assembly until the latch engages.

(4) Replace the two rudder pedals (A, fig. 2-2) on the two pedal arms.

2-12. Removal and Replacement of Pilot's and Copilot's Control Units
(fig. 2-1)

Removal and replacement of any control unit on the cockpit indicator panel assembly, or the pipilot's or copilot's intercom control on the electrical control console assembly, is accomplished by performing the procedures in this paragraph. The instructions cover removal and replacement of the uhf control unit, vhf receiver-transmitter, fm control unit, pilot's or copilot's intercom control, and the adf control unit.

NOTE

All controls for the vhf radio set are located on the front of the vhf receiver-transmitter, which also serves as a control unit for the vhf radio set.

a. Removal of Control Unit.

(1) Loosen the four (or eight, as applicable) Dzus fasteners that secure the control unit to the cockpit indicator panel assembly (or electrical control console assembly).

(2) Pull the control unit out of the cockpit indicator panel assembly (or electrical control console assembly) and disconnect the cable(s) (RF, IF, power and control, or other electrical cable) from the rear of the control unit.

b. Replacement of Control Unit.

NOTE

Screw-type fasteners are used to secure

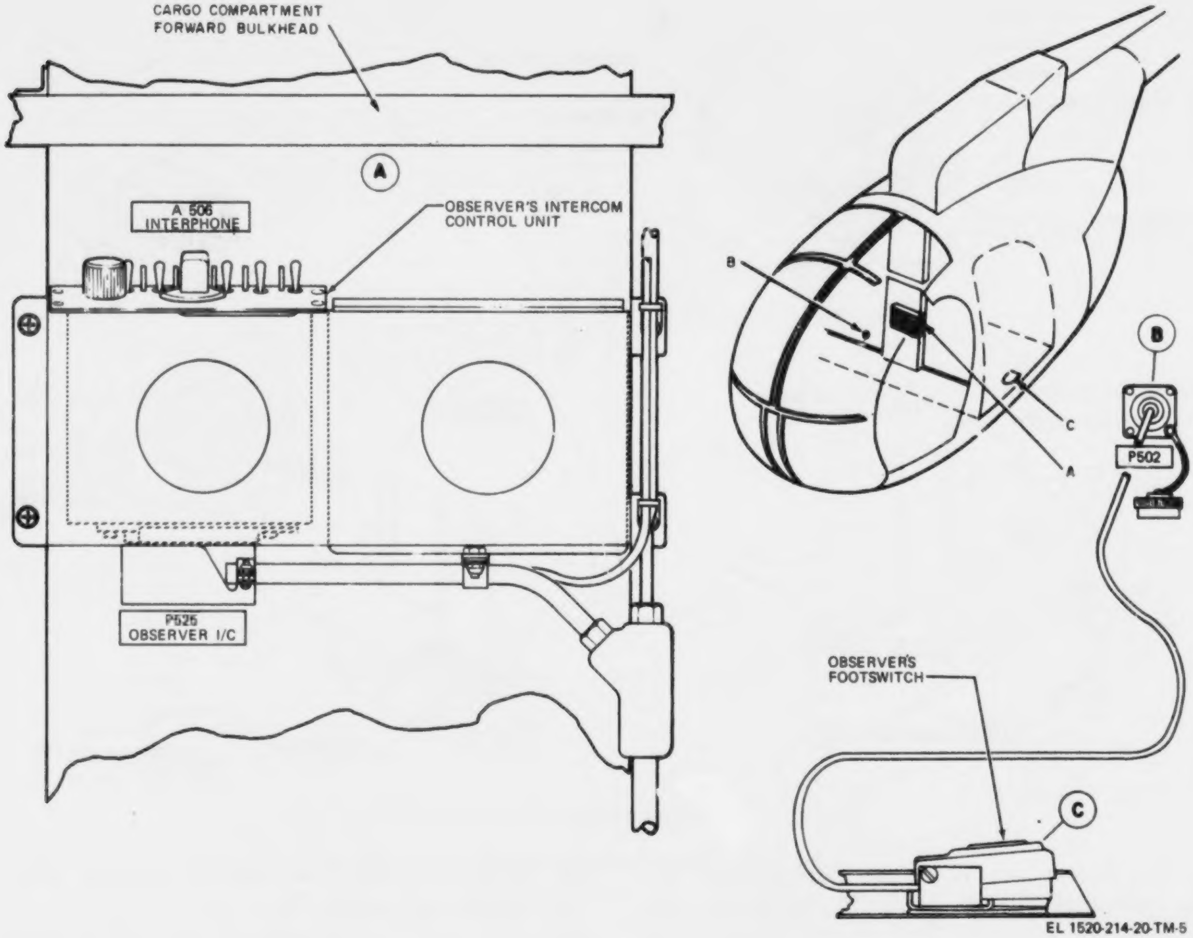

CARGO COMPARTMENT
FORWARD BULKHEAD
A
A 506
INTERPHONE
OBSERVER'S INTERCOM
CONTROL UNIT
P525
OBSERVER I/C
B
C
A
B
P502
OBSERVER'S
FOOTSWITCH
C
EL 1520-214-20-TM-5

Figure 2-4. Installation of observer's intercom control unit.

the connector at the rear of the intercom control.

(1) Connect the cable(s) (RF, IF, power and control or other electrical cable) to the rear of the control unit.

(2) Insert the control unit into the opening in the cockpit indicator panel assembly (or electrical control console assembly) and tighten the four (or eight, as applicable) Dzus fasteners securely.

• (3) Perform the following adjustments after replacement of the indicated control units:

Control unit replaced	*Adjustment*
Uhf control unit	Preset channels (para 2-45)
Fm control unit	Fm facility squelch adjustment (para 2-44).

2-13. Removal and Replacement of Observer's Intercom Control Unit
(fig. 2-4)

a. Removal of Observer's Intercom Control Unit.

(1) Disconnect observer's plug P525 from observer's intercom control unit.

(2) Loosen the four screws that secure the control unit to the control unit case.

(3) Lift the control unit from the control unit case.

b. Replacement of Observer's Intercom Control Unit.

(1) Place control unit in the control unit case and tighten the four screws that secure the unit.

(2) Connect observer's plug P525 to intercom control unit.

2-14. Removal and Replacement of External Blower

(fig. 2-3)

a. Removal of External Blower.

(1) Remove the uhf receiver-transmitter from the lower section electronic compartment of the aircraft (para 2-11*a* and *b*) to gain access to the external blower.

(2) Use a No. 6 Allen wrench to loosen the four captive retaining screws (A, fig. 2-3) that fasten the external blower to the uhf receiver-transmitter.

(3) Pull the external blower away from the uhf receiver-transmitter to disconnect the external blower connector from the connector (not shown) on the uhf receiver-transmitter.

b. Replacement of External Blower.

(1) Align the four captive retaining screws (A, fig. 2-3) on the external blower with the mounting holes on the uhf receiver-transmitter.

CAUTION

> Do not twist, turn, or force the external blower connector into the connector (not shown) on the uhf receiver-transmitter.

(2) Push the external blower straight forward to connect the external blower connector with the connector on the uhf receiver-transmitter.

(3) Fasten the external blower to the uhf receiver-transmitter with the four captive retaining screws and tighten securely with the No. 6 Allen wrench.

2-15. Removal and Replacement of Reflectometer

(fig. 2-3)

a. Removal of Reflectometer.

(1) Remove the uhf receiver-transmitter from the lower section electronic compartment of the aircraft (para 2-11*a* and *b*).

(2) Disconnect the pendant cable connector (B, fig. 2-3) from the connector on the uhf receiver-transmitter.

(3) Loosen the three captive retaining screws that fasten the reflectometer to the front of the dust cover on the uhf receiver-transmitter. Remove the reflectometer from the front of the dust cover.

b. Replacement of Reflectometer.

(1) Align the three captive retaining screws (B, fig. 2-3) on the reflectometer with the mounting holes on the front of the dust cover on the uhf receiver-transmitter. Tighten the captive retaining screws securely.

(2) Connect the pendant cable connector to the center connector on the uhf receiver-transmitter.

2-16. Removal and Replacement of Uhf/Vhf Matching Unit

(fig. 2-5)

Removal and replacement of the uhf/vhf matching unit requires removal of the plenum chamber access door (B, fig. 2-5), for access to the uhf/vhf matching unit.

a. Removal of Uhf/Vhf Matching Unit.

(1) Loosen the eight fasteners that secure the plenum chamber access door to the right side of the engine inlet aft fairing; remove the plenum chamber access door from the engine inlet aft fairing.

(2) Disconnect the uhf/vhf antenna cable from the front of the uhf/vhf matching unit.

(3) Remove the top nut and two washers that secure the rear terminal lug on the uhf/vhf antenna lead (a flat braided lead) to the uhf/vhf antenna bracket (D, fig. 2-5).

(4) Remove the four screws and washers that secure the uhf/vhf matching unit to the bracket on the boom fairing and remove the matching unit (B, fig. 2-5).

(5) Unless replacement is necessary, do not unsolder the braided antenna lead from the terminal stud on the uhf/vhf matching unit.

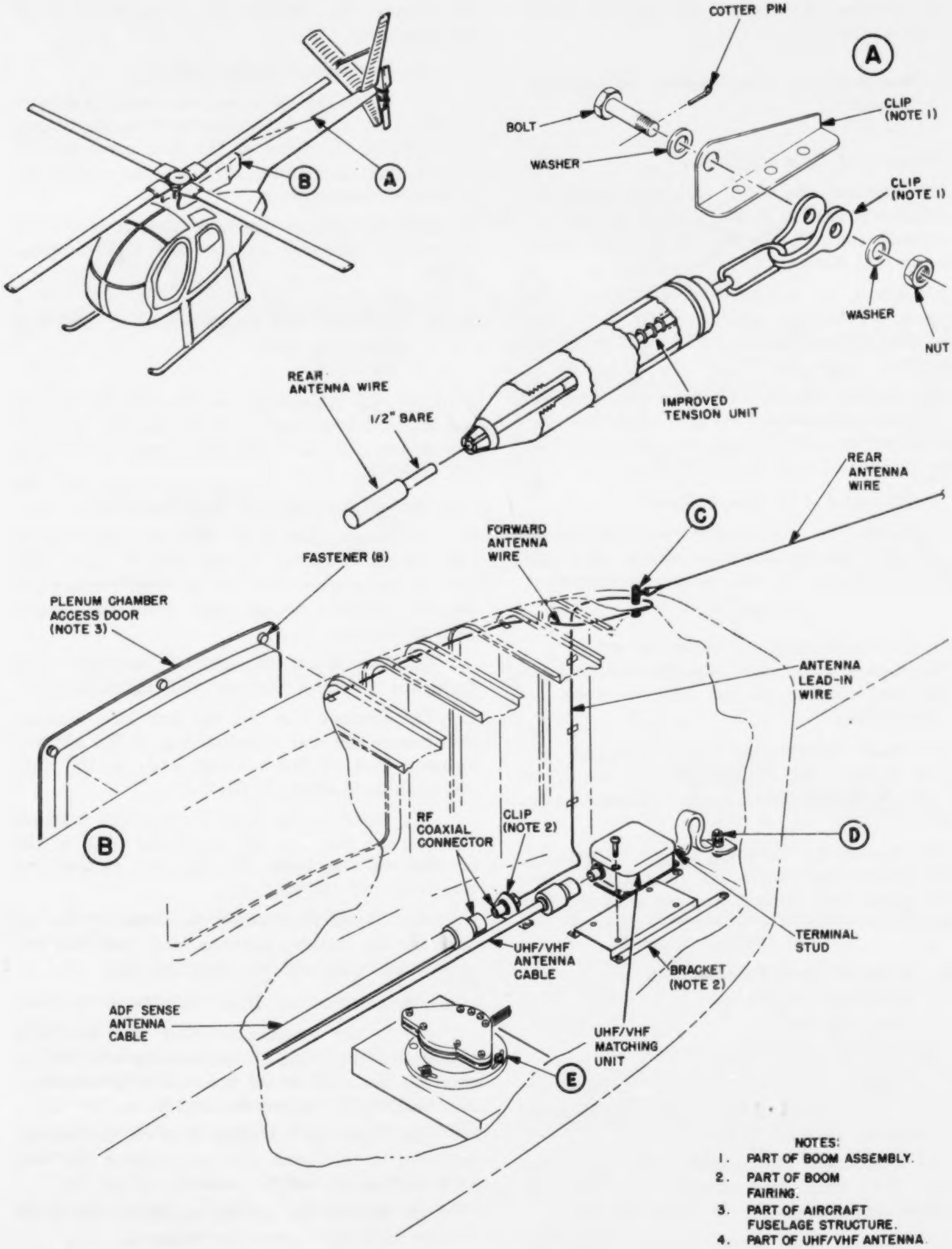
b. Replacement of Uhf/Vhf Matching Unit.

(1) If the braided antenna lead has been removed, slide a length of 1/4-inch plastic tubing over the lead and solder the lead to the terminal stud on the uhf/vhf matching unit.

(2) Place the matching unit on the bracket attached to the boom fairing; position the unit with the braided lead to the rear.

(3) Attach the uhf/vhf matching unit to the bracket with four screws and washers.

(4) Place one washer over the permanently secured nut on the uhf/vhf antenna bracket (in-


COTTER PIN
A
BOLT
CLIP (NOTE 1)
WASHER
CLIP (NOTE 1)
B
A
WASHER
NUT
REAR ANTENNA WIRE
1/2" BARE
IMPROVED TENSION UNIT
REAR ANTENNA WIRE
C
FORWARD ANTENNA WIRE
FASTENER (8)
PLENUM CHAMBER ACCESS DOOR (NOTE 3)
ANTENNA LEAD-IN WIRE
B
RF COAXIAL CONNECTOR
CLIP (NOTE 2)
D
TERMINAL STUD
UHF/VHF ANTENNA CABLE
BRACKET (NOTE 2)
ADF SENSE ANTENNA CABLE
UHF/VHF MATCHING UNIT
E

NOTES:
1. PART OF BOOM ASSEMBLY.
2. PART OF BOOM FAIRING.
3. PART OF AIRCRAFT FUSELAGE STRUCTURE.
4. PART OF UHF/VHF ANTENNA.

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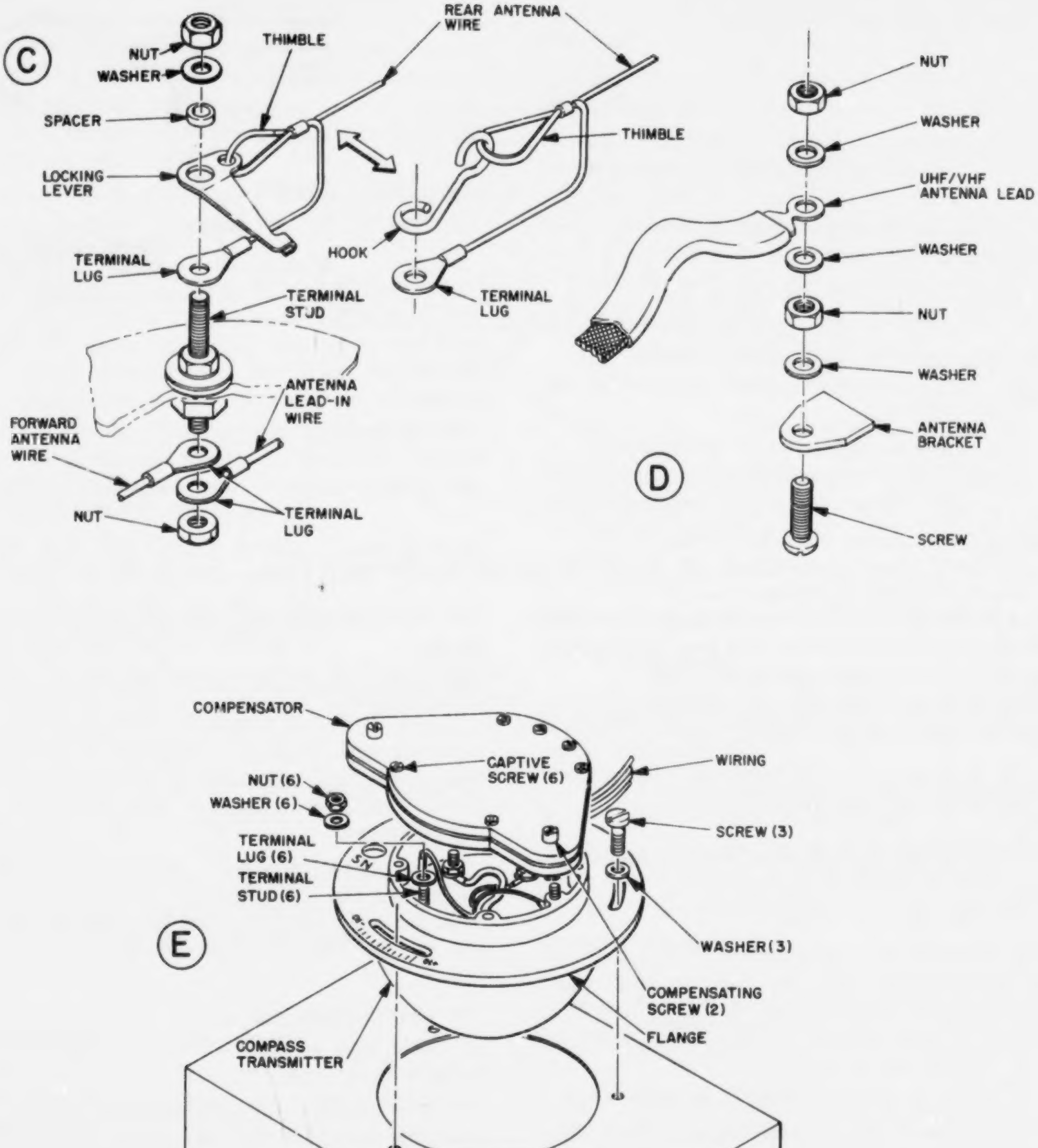
Figure 2-5①. Installation of uhf/vhf matching unit, adf sense antenna, and compass transmitter (sheet 1 of 2).


C
NUT
WASHER
THIMBLE
REAR ANTENNA WIRE
SPACER
LOCKING LEVER
THIMBLE
HOOK
TERMINAL LUG
TERMINAL STUD
TERMINAL LUG
ANTENNA LEAD-IN WIRE
FORWARD ANTENNA WIRE
NUT
TERMINAL LUG
NUT
WASHER
UHF/VHF ANTENNA LEAD
WASHER
NUT
WASHER
ANTENNA BRACKET
D
SCREW
COMPENSATOR
CAPTIVE SCREW (6)
WIRING
NUT (6)
WASHER (6)
SCREW (3)
TERMINAL LUG (6)
TERMINAL STUD (6)
E
WASHER (3)
COMPENSATING SCREW (2)
FLANGE
COMPASS TRANSMITTER
BRACKET (NOTE 2)

TM1520-214-20-C1-866②

Figure 2–5②. Installation of uhf/vhf matching unit, adf sense antenna, and compass transmitter (sheet 2 of 2).

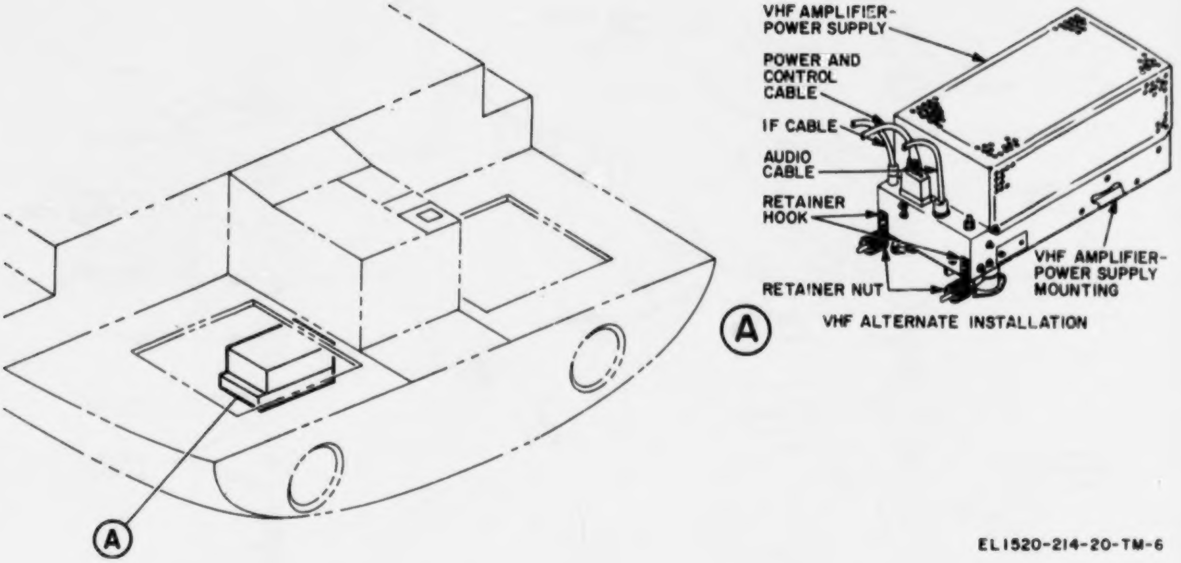

VHF AMPLIFIER-POWER SUPPLY
POWER AND CONTROL CABLE
IF CABLE
AUDIO CABLE
RETAINER HOOK
RETAINER NUT
VHF AMPLIFIER-POWER SUPPLY MOUNTING
Ⓐ VHF ALTERNATE INSTALLATION
Ⓐ
EL1520-214-20-TM-6

Figure 2-6. Installation of vhf amplifier-power supply.

stalled in the rear wall of the fairing); place the terminal lug of the antenna lead over the washer and secure with another washer and nut.

(5) Connect the uhf/vhf antenna cable to the front of the matching unit.

(6) Replace the plenum chamber access door on the engine inlet fairing.

2-17. Removal and Replacement of Amplifier-Power Supply

(figs. 2-2 and 2-6)

Before removal and replacement of the vhf amplifier-power supply (A, fig. 2-6) is performed, the access door assembly on the right front of the floor in the pilot's compartment must be removed (fig. 2-2).

a. Removal of Amplifier-Power Supply

(1) Remove the compartment access door assembly (fig. 2-2) from the right front of the floor in the pilot's compartment (para 2-11*a*).

(2) Disconnect the power and control, IF and audio cables (fig. 2-6) from the vhf amplifier-power supply.

(3) Rotate the two retainer nuts on the vhf amplifier-power supply mounting counterclockwise until the two retainer nuts disengage from the two retainer hooks.

(4) Lift and remove the amplifier-power supply.

b. Replacement of Amplifier-Power Supply.

(1) Lower the amplifier-power supply (fig. 2-6) through the accesss opening in the floor of the pilot's compartment and slide the amplifier-power supply onto the vhf amplifier-power supply mounting.

(2) Swivel the two retainer nuts upward to engage the two retainer hooks. Tighten the retainer nuts securing the amplifier-power supply on the vhf amplifier power supply mounting.

(3) Connect the power and control cable, IF cable, and audio cable to the amplifier-power supply.

(4) Replace the compartment access door assembly and the two tail rotor control pedals (para 2-11*d*).

2-18. Removal and Replacement of Fm Receiver-Transmitter

(fig. 2-7)

Before removal and replacement of the fm receiver-transmitter is performed, the access door assembly on the left front of the floor of the pilot's compartment must be removed in the same manner as the right side door (para 2-11*a*) for access to the fm receiver-transmitter in the lower section electronics compartment.

a. Removal of Fm Receiver-Transmitter.

(1) Release the locking handle catch (D, fig. 2-7) from its secured (down) position and pull the locking handle outward and downward.

(2) Pull out firmly on the locking handle to extract the fm receiver-transmitter from the fm radio set mounting.

(3) Lift the fm receiver-transmitter up and out of the access opening in the floor of the pilot's compartment.

b. Replacement of Fm Receiver-Transmitter.

(1) Lower the fm receiver-transmitter (D, fig. 2-7) through the access opening in the floor of the pilot's compartment and place the fm receiver-transmitter on the fm radio set mounting.

(2) Slide the fm receiver-transmitter back on the fm radio set mounting carefully; ensure the guide pins at the rear properly engage the guide pin receptacles (not shown).

(3) Lift the locking handle, press inward, and secure with the locking handle catch.

(4) Perform the squelch adjustment on the fm receiver-transmitter (para 2-44).

(5) Secure the compartment door assembly and control pedals as indicated in paragraph 2-11*d*.

2-19. Removal and Replacement of Tunable Fm Antenna Coupler

(A, fig. 2-7)

The fm antenna coupler is mounted on the front side of the floor support bulkhead, in the forward section of the pilot's compartment.

a. Removal.

(1) Disconnect the antenna cable and power and control cable from the coupler.

(2) Remove the terminal screw and washer that secures the antenna lead-in (or jumper wire) to the coupler.

(3) Remove the four screws and washers that secure the fm antenna coupler to the clips on the bulkhead. Remove the coupler.

b. Replacement.

(1) Place the coupler in position, on the three clips on the front of the floor support bulkhead (lower section), in the forward section pilot's compartment.

(2) Secure the coupler with four screws and washers.

(3) Attach the terminal lug on the antenna lead-in wire (or jumper wire) to the terminal on the coupler with the terminal screw and washers.

(4) Connect the antenna cable and power and control cable to the receptacles on the coupler.

(5) Perform the squelch adjustment on the fm receiver-transmitter (para 2-44).

2-20. Removal and Replacement of Nontunable Fm Antenna Coupler

(fig. 2-7)

a. Removal.

(1) Disconnect the RF antenna cable from the fm antenna coupler connector (AA, fig. 2-7).

(2) Remove the hardware attaching the stretch-type antenna jumper wire assembly to the two antenna clips (A, fig. 2-7).

(3) Remove the four screws and washers that secure the fm antenna coupler (A, fig. 2-7) to clips on the aircraft bulkhead. Remove the fm antenna coupler.

b. Replacement.

(1) Position the fm antenna coupler and fasten in place with the screws and washers previously removed.

(2) Fasten the jumper wire assembly to the two antenna clips (A, fig. 2-7).

(3) Attach the RF antenna cable to the antenna coupler (A, fig. 2-7).

(4) Verify proper operation of the fm antenna system (para 2-47).

2-21. Removal and Replacement of Homing Transformers

(F, fig. 2-7)

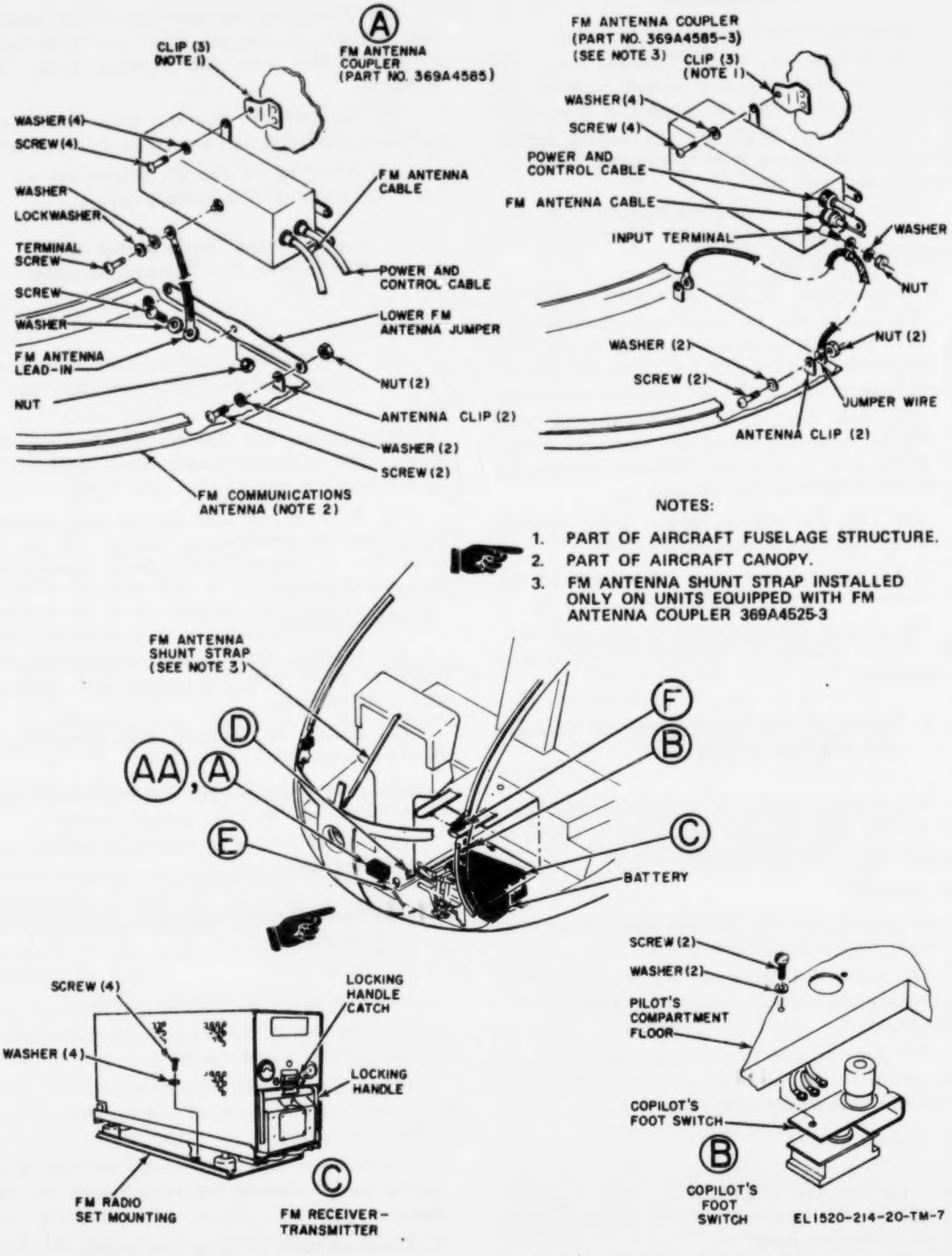
a. Removal of Homing Transformers.

(1) Disconnect the coaxial cable connector from the homing transformer.

(2) Remove the two nuts and washers that secure the coupling wire to the terminal studs on the transformer.

(3) Remove the four nuts, screws, and washers used to install the transformer on the support.

b. Replacement of Homing Transformer.


A
FM ANTENNA COUPLER (PART NO. 369A4585)
CLIP (3) (NOTE 1)
WASHER (4)
SCREW (4)
FM ANTENNA CABLE
WASHER
LOCKWASHER
TERMINAL SCREW
POWER AND CONTROL CABLE
SCREW
WASHER
LOWER FM ANTENNA JUMPER
FM ANTENNA LEAD-IN
NUT (2)
NUT
ANTENNA CLIP (2)
WASHER (2)
SCREW (2)
FM COMMUNICATIONS ANTENNA (NOTE 2)
FM ANTENNA COUPLER (PART NO. 369A4585-3) (SEE NOTE 3)
CLIP (3) (NOTE 1)
WASHER (4)
SCREW (4)
POWER AND CONTROL CABLE
FM ANTENNA CABLE
INPUT TERMINAL
WASHER
NUT
NUT (2)
WASHER (2)
SCREW (2)
JUMPER WIRE
ANTENNA CLIP (2)
FM ANTENNA SHUNT STRAP (SEE NOTE 3)
D
AA, A
E
F
B
C
BATTERY
SCREW (4)
WASHER (4)
LOCKING HANDLE CATCH
LOCKING HANDLE
FM RADIO SET MOUNTING
C
FM RECEIVER-TRANSMITTER
SCREW (2)
WASHER (2)
PILOT'S COMPARTMENT FLOOR
COPILOT'S FOOT SWITCH
B
COPILOT'S FOOT SWITCH
EL1520-214-20-TM-7

NOTES:

1. PART OF AIRCRAFT FUSELAGE STRUCTURE.
2. PART OF AIRCRAFT CANOPY.
3. FM ANTENNA SHUNT STRAP INSTALLED ONLY ON UNITS EQUIPPED WITH FM ANTENNA COUPLER 369A4525-3

Figure 2-7①. Installation of fm equipment, and copilot's foot switch (sheet 1 of 3).

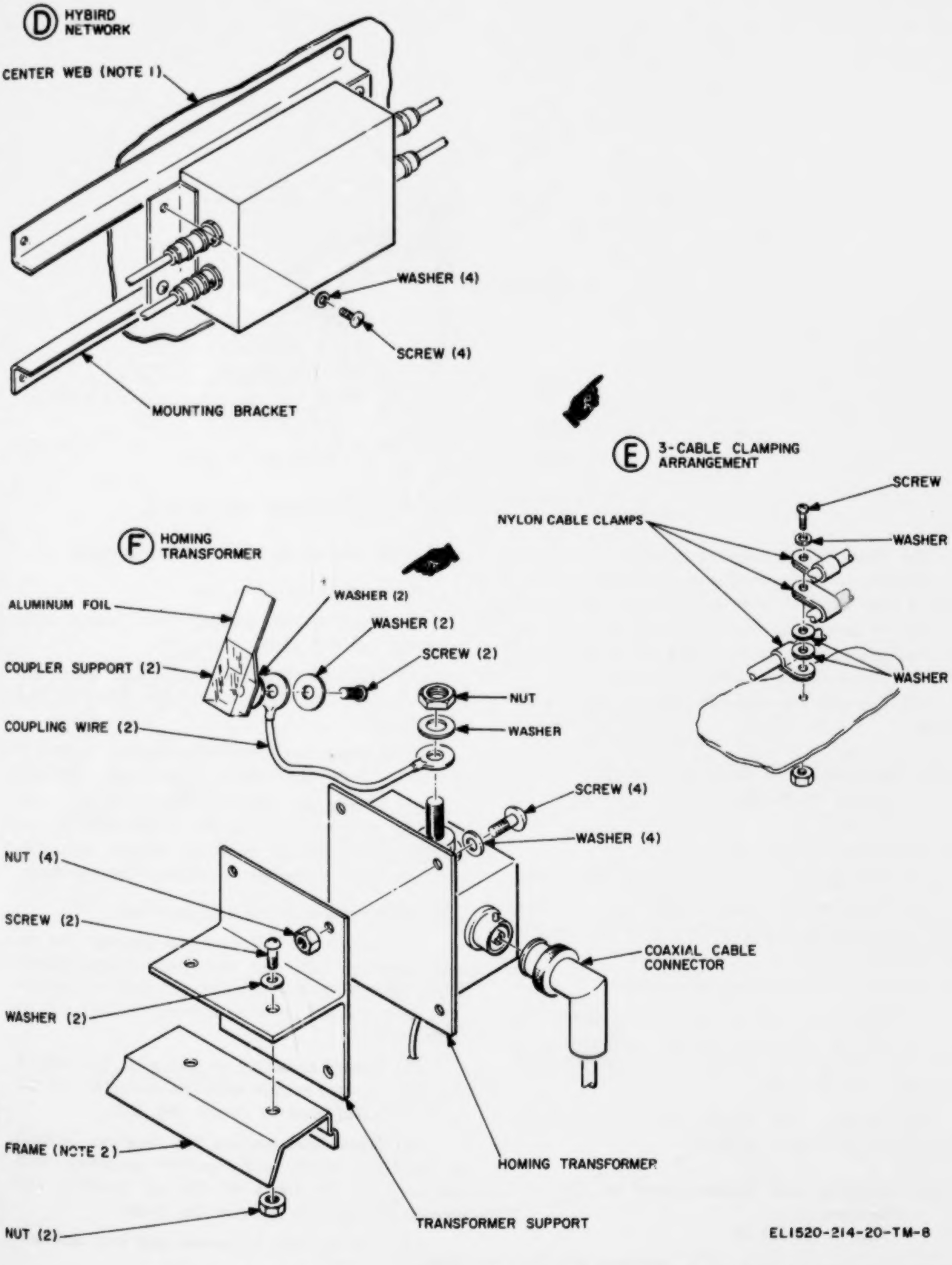

D HYBIRD NETWORK
CENTER WEB (NOTE 1)
WASHER (4)
SCREW (4)
MOUNTING BRACKET
E 3-CABLE CLAMPING ARRANGEMENT
SCREW
NYLON CABLE CLAMPS
WASHER
WASHER
F HOMING TRANSFORMER
ALUMINUM FOIL
WASHER (2)
WASHER (2)
COUPLER SUPPORT (2)
SCREW (2)
NUT
COUPLING WIRE (2)
WASHER
SCREW (4)
WASHER (4)
NUT (4)
SCREW (2)
COAXIAL CABLE CONNECTOR
WASHER (2)
FRAME (NOTE 2)
HOMING TRANSFORMER
NUT (2)
TRANSFORMER SUPPORT
EL1520-214-20-TM-8

Figure 2-7②. Installation of fm equipment, and copilot's foot switch (sheet 2 of 3).

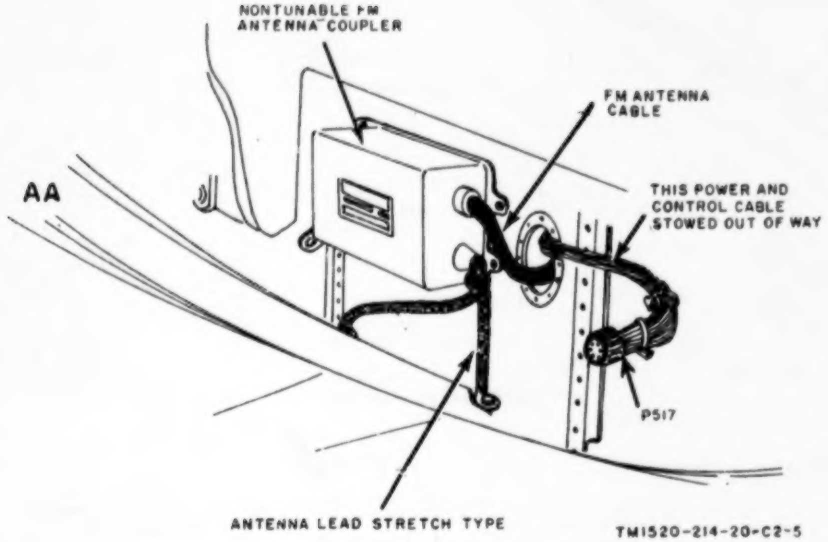

NONTUNABLE FM ANTENNA COUPLER
FM ANTENNA CABLE
AA
THIS POWER AND CONTROL CABLE STOWED OUT OF WAY
P517
ANTENNA LEAD STRETCH TYPE
TM1520-214-20-C2-5

Figure 2-7③. Installation of fm equipment, and copilot's foot switch (sheet 3 of 3).

(1) Place the homing transformer in mounting position on the transformer support and secure it with the four screws, washers, and nuts.

(2) Connect the two coupling wires from the coupler supports to the terminal studs of the transformer, using the washers and nuts.

(3) Connect the coaxial cable to the transformer.

2-22. Removal and Replacement of Hybrid Network

(E, fig. 2-7)

a. Removal of Hybrid Network.

(1) Disconnect the coaxial cable connectors.

(2) Remove the four screws and washers used to secure the hybrid network to the mounting bracket.

b. Replacement of Hybrid Network.

(1) Place the hybrid network in mounting position on the mounting bracket and secure it with four screws and washers; anchor nuts are installed in the bracket.

(2) Connect the coaxial cables to the receptacles on the hybrid network.

2-23. Removal and Replacement of Adf Receiver

(figs. 1-5 and 2-8)

The adf receiver is located in the pilot's right-hand lower section electronics compartment.

a. Removal of Adf Receiver.

(1) Remove the compartment access door assembly (para 2-11*a*).

(2) Disconnect the adf loop and sense antenna cables (fig. 2-8) from the front of the adf receiver.

(3) Loosen the receiver locknut and push it down to clear the front of the adf receiver.

(4) Grasp the adf receiver handle and pull the adf receiver toward the right side of the aircraft; lift the adf receiver off the mounting and remove it from the electronic compartment.

b. Replacement of the Adf Receiver.

(1) Lower the adf receiver through the access opening into the electronic compartment. Place the adf receiver on the adf receiver mounting; slide the adf receiver toward the left side of the aircraft.

(2) Insure that the connector at the rear of the adf receiver mates with the connector at the rear of the adf receiver mount (fig. 1-5).

(3) Raise and engage the receiver locknut at the front of the adf receiver mounting with the hook at the front of the adf receiver and tighten the receiver locknut (fig. 2-8).

(4). Connect the adf sense and loop antenna cables.

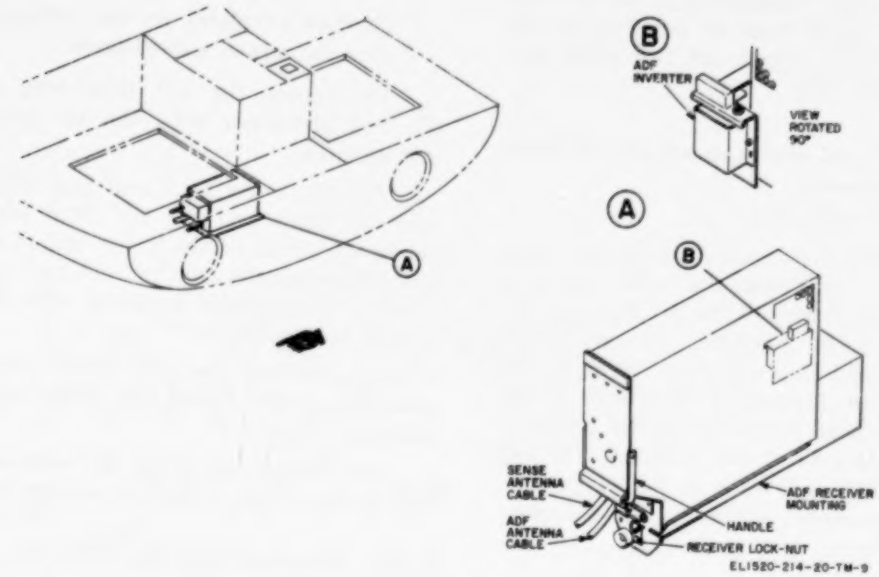

B
ADF INVERTER
VIEW ROTATED 90°
A
B
A
SENSE ANTENNA CABLE
ADF ANTENNA CABLE
ADF RECEIVER MOUNTING
HANDLE
RECEIVER LOCK-NUT
EL1520-214-20-TM-9

Figure 2-8. Installation of adf receiver.

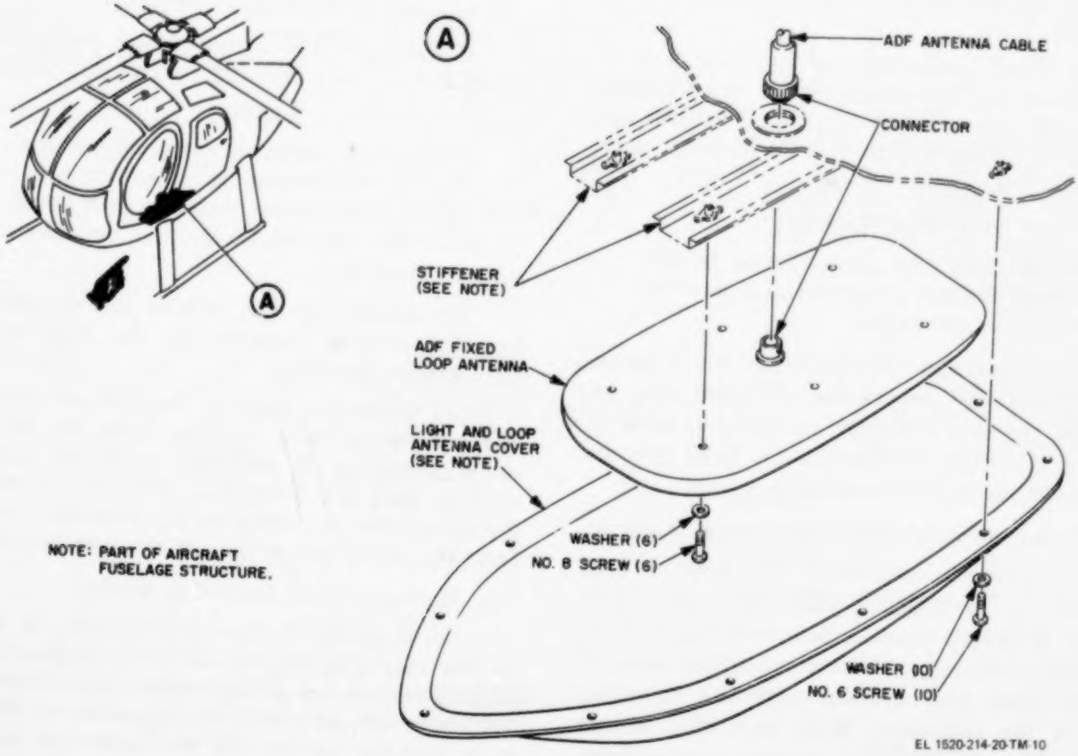

A
ADF ANTENNA CABLE
CONNECTOR
STIFFENER (SEE NOTE)
ADF FIXED LOOP ANTENNA
LIGHT AND LOOP ANTENNA COVER (SEE NOTE)
WASHER (6)
NO. 8 SCREW (6)
WASHER (10)
NO. 6 SCREW (10)
A
NOTE: PART OF AIRCRAFT FUSELAGE STRUCTURE.
EL 1520-214-20-TM-10

Figure 2-9. Installation of adf loop antennas.

(5) Replace the compartment access door assembly on the right front of the floor in the pilot's compartment; replace the two rotor control pedals (para 2-11*d*).

2-24. Removal and Replacement of Adf Fixed Loop Antenna

(figs. 2-9 and 2-10).

Before removal and replacement on the adf fixed loop antenna is performed, the light and loop antenna cover (fig. 2-9) and the left foot support fairing (B, fig. 2-10) must be removed for access to the adf fixed loop antenna. The light and loop antenna cover, formed of red plastic (polycarbonate), is located below the pilot's compartment on the underside of the fuselage. The left foot support fairing is located in the cargo compartment on the canted bulkhead below the copilot's seat structure.

a. Removal of Adf Fixed Loop Antenna.

(1) Remove the four screws (B, fig. 2-10) and washers that secure the left foot support fairing and remove the foot support fairing.

(2) Reach through the fairing opening and disconnect the adf antenna cable from the connector at the center top of the adf fixed loop antenna (fig. 2-10).

(3) While supporting the light and loop antenna cover at the underside of the fuselage, loosen and remove the 10 No. 6 screws and washers and the light and loop antenna cover (fig. 2-9).

CAUTION

> The adf fixed loop antenna must be held securely and not permitted to drop when performing (4) below.

(4) Loosen and remove the six No. 8 screws and washers that secure the adf fixed loop antenna to the two stiffeners on the underside of the aircraft, while holding the adf fixed loop antenna. Remove the adf fixed loop antenna.

b. Replacement of Adf Fixed Loop Antenna.

(1) Raise the adf fixed loop antenna (fig. 2-9) into its mounting position with the top of the adf fixed loop antenna positioned against the two stiffeners; align the six mounting holes in the adf fixed loop antenna with the mounting holes in the stiffeners. Make sure the thinner end of the adf fixed loop antenna is positioned toward the rear of the aircraft.

NOTE

> Captive nutplates on the stiffeners secure the screws and washers.

(2) Secure the adf fixed loop antenna to the two stiffeners with the six No. 8 screws and washers.

(3) Place the light and loop antenna cover over the light and the adf fixed loop antenna, on the underside of the lower section of the fuselage structure. Secure the light and loop antenna cover to the fuselage structure with the 10 No. 6 screws and washers.

(4) Connect the adf antenna cable to the connector at the center top of the adf fixed loop antenna.

(5) Install and secure the removed foot fairing (B, fig. 2-10) with four screws and washers.

2-25. Removal and Replacement of Dc-to-Ac Inverter, Adf

(figs. 2-2 and 2-8)

The adf dc-to-ac inverter is mounted on the adf receiver mount. It is located in the pilot's right front lower section electronics compartment next to the vhf/uhf communications equipment.

a. Removal of the Dc-to-Ac Inverter.

(1) Remove the compartment access door (para 2-11*a*) and the uhf receiver-transmitter.

NOTE

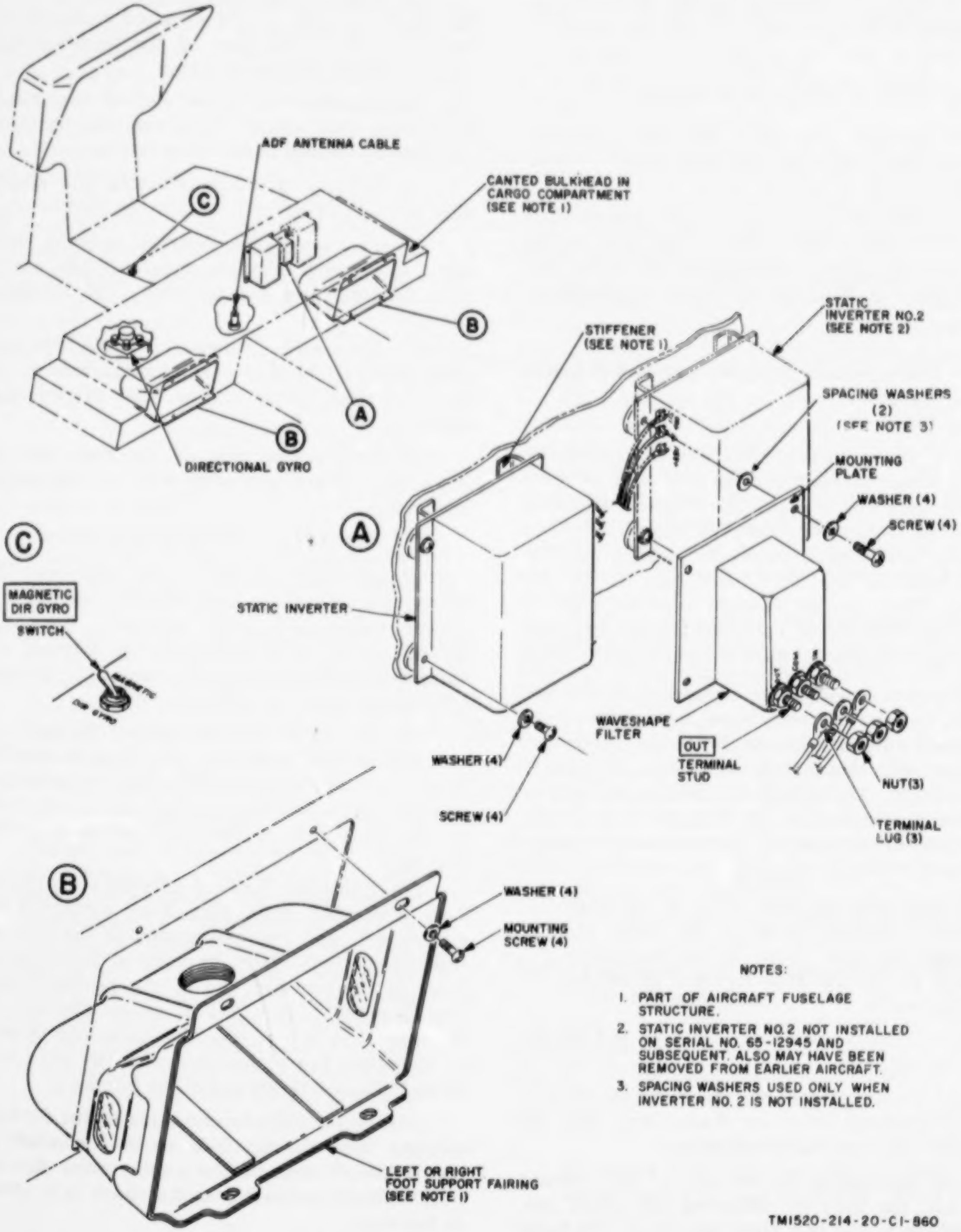
> In alternate configurations, vhf communication equipment is substituted for the uhf equipment. Refer to paragraph 2-17 for removal of the vhf amplifier-power supply.

(2) Loosen the two captive screws that secure the ac-to-dc inverter (B, fig. 2-8) to the adf receiver mounting.

(3) Grasp the sides of the dc-to-ac inverter and pull the dc-to-ac inverter from the adf receiver mounting. If necessary, rock the dc-to-ac inverter back and forth as it is being removed to disconnect the connector on the dc-to-ac inverter from the connector on the adf receiver mounting.

b. Replacement of Dc-to-Ac Inverter.

(1) Place the dc-to-ac inverter (B, fig. 2-8) on the rear side of the adf receiver mounting, making certain the potentiometer is positioned at the lower left, and that the connector on the dc-to-ac inverter mates with the connector on the adf receiver mounting.


ADF ANTENNA CABLE
CANTED BULKHEAD IN CARGO COMPARTMENT (SEE NOTE 1)
C
B
A
B
DIRECTIONAL GYRO
STATIC INVERTER NO.2 (SEE NOTE 2)
STIFFENER (SEE NOTE 1)
SPACING WASHERS (2) (SEE NOTE 3)
MOUNTING PLATE
WASHER (4)
SCREW (4)
C
A
MAGNETIC DIR GYRO
SWITCH
MAGNETIC
DIR GYRO
STATIC INVERTER
WAVESHAPE FILTER
OUT
TERMINAL STUD
WASHER (4)
SCREW (4)
NUT (3)
TERMINAL LUG (3)
B
WASHER (4)
MOUNTING SCREW (4)
LEFT OR RIGHT FOOT SUPPORT FAIRING (SEE NOTE 1)

NOTES:

1. PART OF AIRCRAFT FUSELAGE STRUCTURE.
2. STATIC INVERTER NO.2 NOT INSTALLED ON SERIAL NO. 65-12945 AND SUBSEQUENT. ALSO MAY HAVE BEEN REMOVED FROM EARLIER AIRCRAFT.
3. SPACING WASHERS USED ONLY WHEN INVERTER NO. 2 IS NOT INSTALLED.

TM1520-214-20-C1-860

Figure 2-10. Installation of directional gyro, static inverte, and waveship filter.

CAUTION

The connectors may be damaged if not properly aligned.

(2) Tighten the two captive screws that secure the dc-to-ac inverter to the adf receiver mounting.

NOTE

DO NOT adjust the potentiometer.

(3) Replace the uhf receiver-transmitter (para 2-11*b*) or vhf amplifier-power supply (para 2-17*b*).

(4) Replace the compartment access door assembly on the right front of the floor in the pilot's compartment, and the two tail rotor control pedals (fig. 2-2), as instructed in paragraph 2-11*d*.

2-26. Removal and Replacement of Adf Sense Antenna

(fig. 2-5)

The adf sense antenna includes an externally mounted rear antenna wire as well as a forward antenna wire and lead-in wire which are located inside the engine air inlet fairing. The lead-in wire can be reached through the plenum chamber access door in the right-hand side of the aft fairing. Work on the forward antenna wire requires the removal of both the plenum chamber access door and the forward section of the fairing.

a. Removal of Adf Sense Antenna. It will seldom be necessary to remove all three parts of the adf sense antenna. In the following procedure, perform only those steps necessary for proper repair. Steps (1) through (3) pertain to the rear antenna wire and steps (4) through (11) pertain to the lead-in wire and the forward antenna wire.

NOTE

If the rear antenna wire is equipped with a locking lever (C, fig. 2-5), unhook the lever from the antenna wire and swing the arm forward to relieve the tension.

(1) Remove the nut (C, fig. 2-5) and washer from the terminal stud.

(2) Pull forward on the antenna wire to slide the locking lever (or hook), and then the terminal lug, from the terminal stud.

(3) Disconnect the aft end of the antenna wire (A, fig. 2-5) by removing the cotter pin, nut, washers, and bolt from the clip on the boom assembly.

(4) Loosen the eight fasteners (B, fig. 2-5) that secure the plenum chamber access door to the right side of the engine inlet fairing (aft section); remove the access door.

(5) Remove the nut (C, fig. 2-5) securing the terminal lugs of the forward antenna and lead-in wires to the base of the terminal stud and remove the lead-in wire lug.

(6) Unsolder the lower end of the lead-in wire from the coaxial connector (B, fig. 2-5) mounted on the clip in the boom fairing.

(7) Remove the tape securing the lead-in wire to the fairing and remove the lead-in wire.

(8) To remove the forward antenna wire, first remove the forward section of the engine inlet fairing from the aircraft (TM 55-1520-214-20).

(9) Remove the forward antenna wire terminal lug (C, fig. 2-5) from the bottom of the terminal stud in the engine inlet fairing (aft section).

(10) Remove the tape (B, fig. 2-5) that secures the forward antenna wire to the engine inlet fairing.

(11) Remove the forward antenna wire.

b. Replacement of Adf Sense Antenna. The following instructions describe the replacement of the entire adf sense antenna. Steps (1) through (10) below pertain to the forward antenna wire and lead-in wire; steps (11) through (19) apply to the rear antenna wire.

(1) The forward antenna wire (B, fig. 2-5) is installed after removing the plenum chamber access door and the forward section of the engine inlet fairing. Place the terminal lug (C, fig. 2-5) on the underside of the terminal stud in the fairing.

(2) Route the forward antenna wire (B, fig. 2-5) inside the upper right-hand corner of the fairing with the free end located at the forward edge of the first plate (or vertical frame structure) in the forward end of the fairing. Using tape, type 471 (para 2-2*b*), secure the wire to the inside surface of the first plate and to each of the other five plates to secure the wire in a straight line to the aft end of the fairing.

(3) Connect the terminal lug of the forward antenna wire (C, fig. 2-5) to the underside of the terminal stud in the engine inlet fairing. Position the terminal lug so that there is no stress on the wire.

(4) Install the forward section of the en-

gine inlet fairing on the aircraft (TM 55-1520-214-20).

(5) Install the antenna lead-in wire through the plenum chamber access door. Place the lead-in wire terminal lug (C, fig. 2-5) over the forward antenna wire terminal lug on the stud.

(6) With the lead-in wire positioned toward the aft end of the fairing, install the terminal nut to secure both lugs in the approximate positions shown in C, figure 2-5.

(7) Loop the antenna lead-in wire in a semi-circle (B, fig. 2-5) to route it forward inside the upper right-hand corner of the fairing and down the first vertical plate (raised frame). Secure the wire to the inside of the plate with tape, type 471 (para 2-2*b*), in three places.

(8) Solder the lower end of the lead-in wire to the rear terminal of the RF coaxial connector (B, fig. 2-5) mounted in a clip bracket on the boom fairing.

(9) Check the terminal stud nut (C, fig. 2-5) securing the two terminal lugs, the lead-in wire, and the forward antenna wire for tightness.

(10) Replace the plenum chamber access door (B, fig. 2-5) on the right side of the engine inlet fairing with the eight fasteners.

WARNING

DANGER! THIS PROCEDURE CALLS FOR THE USE OF EXTREMELY HAZARDOUS ADHESIVE. Do not get in eyes, on skin or clothing. Use only with eye-protective goggles. Do not breathe vapor. Use with adequate ventilation. Contact will result in extremely rapid bonding of tissues and may bond skin to skin or to other materials.

FIRST AID TREATMENT — In case of accident, remove contaminated clothing, flush skin or eyes with plenty of water. Remove from skin with paper towels. Eyelids should be held open, and the eyes flushed with plenty of water. Call a physician.

NOTE

The rear antenna wire, installed according to the following steps, includes a tension unit which provides the wire with constant tension as well as electrical insulation from the boom assembly. A rubber tension unit, when used, should have a free (relaxed) length of 3⅛ inches. The installed (stretched) length should be from 3⅜ to 3⅞ inches. if the installed length of the rubber tension unit is not within this range, the length of the rear antenna wire or the connecting hooks may be altered to obtain the necessary tension. When the rubber unit is defective it is replaced with the improved tension unit. (PN 5ARM 300-2CN). Follow the procedures for wire preparation and removal in figure 2-10.1. The improved tension unit should be stretched ½ inch when installed properly. To avoid cracks in the tension unit cap, the cap should be snugged only finger tight on the insulator body. To assure the cap does not work loose, a couple of drops of adhesive, NSN 8040-00-142-9193, should be applied to the male threads immediately before the cap is screwed in place.

(11) The forward end of the rear antenna wire is installed with a locking lever (or hook) and a terminal lug. A tension unit is installed at the aft end. Before installing the rear antenna wire, a tension unit is attached to the aft end of the antenna wire.

(12) If a chain hook is used at the forward end (C, fig. 2-5), connect it to the forward thimble and secure it by bending the chain hook loop closed. (The antenna wire length, forward thimble to rear tension unit, is approximately 83 inches.)

(13) Attach the rear retainer to the boom assembly hook (A, fig. 2-5) using the nut, bolt, and washer provided. Do not tighten the nut at this time.

(14) Place the terminal lug (C, fig. 2-5) on the terminal stud located in the aft end of the air inlet fairing.

(15) If a hook is used at the forward end (C, fig. 2-5), carefully pull the hook forward stretching the tension unit, and slide the hook over the terminal stud. Secure with the washer and nut.

(16) If a locking lever (C, fig. 2-5) is used, slide the spacer over the terminal stud and install the locking lever so that the spacer is centered inside the hole in the lever. Install the washer and nut, checking to be sure the lever pivots freely on the spacer.

(17) Pull the wire taut by swinging the arm of the locking lever toward the rear. Lock the lever by hooking the arm on the antenna wire.

(18) With all parts properly aligned, check the length of the tension unit. (Refer to caution preceding step [11].) Tighten the nut (A, fig. 2-5) at the aft end and secure the nut with a cotter pin.

(19) Apply corrosion preventive compound (MIL-C-16173).

2-27. Removal and Replacement of the Directional Gyro

The directional gyro is located within the pilot's compartment seat structure on the left side. Access is through the Left foot support fairing from the cargo compartment side of the canted bulkhead.

WARNING

The output of the directional gyro is 115 vac, 400 Hertz. Insure that GEN-OFF, BATT-

OFF-EXT and INVERTER switches (fig. 2-1) are OFF during removal and replacement of gyro/magnetic set components.

a. Removal of Directional Gyro.

(1) Remove the four screws (B, fig. 2-10) and washers that secure the foot support fairing; remove the foot support fairing.

(2) Disconnect the mating connector from connector J1 on the base of the directional gyro (fig. 1-6).

CAUTION

Handle the directional gyro with great care. Any shock to the directional gyro may render it defective and make the gyromagnetic compass set inaccurate.

(3) Remove the four screws and washers that secure the directional/gyro to the seat structure and withdraw the directional/gyro.

b. Replacement of Directional Gyro.

(1) Place the directional gyro on the tray in mounting position with connector J1 on the base positioned toward the interior of the aircraft.

(2) Secure the base of the directional gyro to the tray by installing two screws and washers through the two holes in the front of the directional gyro base, and through the two slots in the rear.

(3) Connect connector J1 on the base of the directional gyro to the mating connector.

(4) Install and secure the removed foot support fairing (B, fig. 2-10) with four screws and washers.

2-28. Removal and Replacement of Compensator

(fig. 2-5)

CAUTION

Use extreme care while removing and replacing the compensator to prevent damage to the compass transmitter from which it must be removed.

NOTE

Compensating checks and adjustments (index error checks, one-cycle error check, and a heading swing during a compass swing) must be performed by direct support, or higher category maintenance after the compensator is removed or replaced. Remove and replace the compensator only when absolutely necessary.

Removal and replacement of the compensator requires removal and replacement of the plenum chamber access door (B, fig. 2-5) for access to the compensator.

a. Removal of Compensator

(1) Loosen the eight fasteners (E, fig. 2-5) that secure the plenum chamber access door to the right side of the engine inlet aft fairing.

(2) Loosen the six captive screws (D, fig. 2-5) that secure the compensator to the top of the compass transmitter; slowly and carefully lift the compensator straight up and off of the compass transmitter.

b. Replacement of Compensator.

CAUTION

Do not overtighten the captive screws to prevent damage to threads of the captive screws and the tapped threads in the compass transmitter.

(1) Position the compensator (E, fig. 2-5) directly over the compass transmitter, align the two compensating adjustment screws with the two holes in the compass transmitter and secure the compensator to the top of the compass transmitter with the six captive screws.

(2) Request direct support, or higher category maintenance personnel to perform compensating checks and adjustments on the compensator for the compas transmitter.

(3) After completion of the compensating checks and adjustments secure the plenum chamber access door (B, fig. 2-5) to the right side of the engine inlet aft fairing with the eight fasteners.

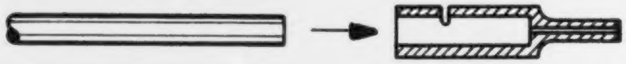
2-29. Removal and Replacement of Compass Transmitter

CAUTION

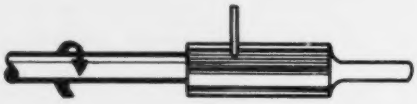
Use extreme care while removing and replacing the compass transmitter. Do not drop it or let it receive hard shocks; shocks can damage the compass transmitter and make the gyromagnetic compass inaccurate.

NOTE

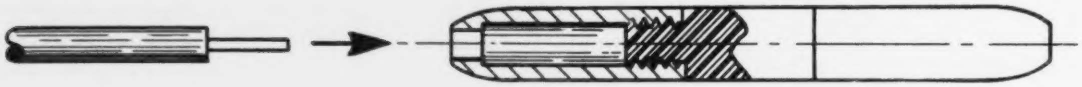
Whenever the compass transmitter is replaced, the compensator installed on the original compass transmitter must be removed for installation on the replacement compass transmitter. Whenever the compass transmitter is replaced, performance of compensating checks and adjustments (index error checks, one-cycle error check, and a heading swing during a compass swing) is necessary.



1. INSERT POLYETHYLENE WIRE INTO APERTURE OF TOOL, TO THE FULL EXTENT, AS SHOWN.

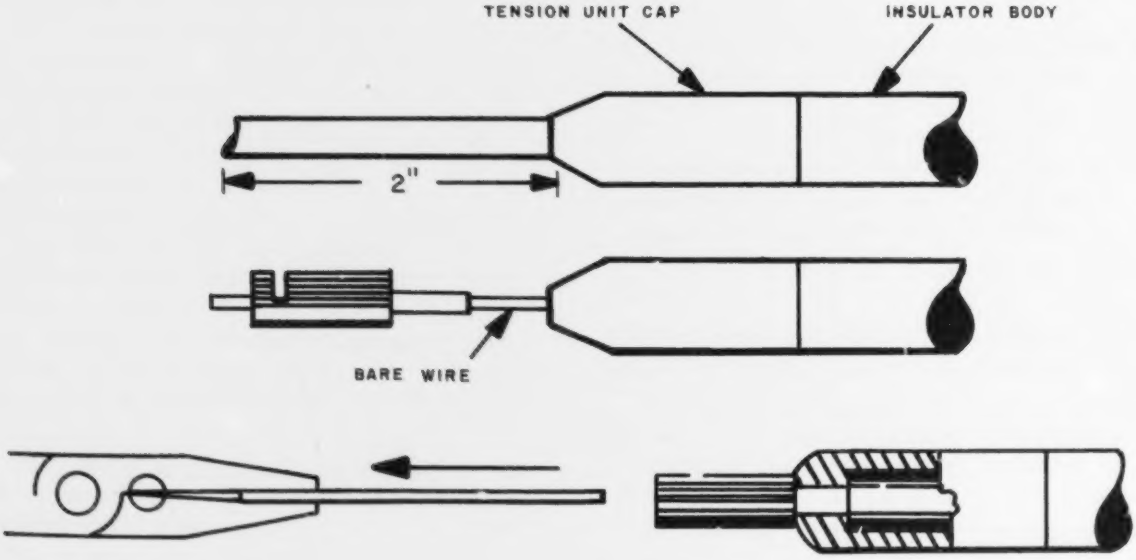


2. CUT POLYETHYLENE COATING BY PRESSING BLADE FIRMLY INTO RECESS AND ROTATING WIRE ONE COMPLETE TURN. REMOVE THE 1/2" OF UNWANTED POLYETHYLENE.



3. INSERT THROUGH NOZZLE APERTURE TO THE FULL EXTENT.

A. TO PREPARE WIRE



B. TO REMOVE WIRE

EL1520-214-35-1-TM-753 ①

Figure 2-10.1. Adf Sense Antenna Wire Preparation.

Removal and replacement of the compass transmitter requires removal of the plenum chamber access door, on the right side of the engine inlet aft fairing, for access to the compass transmitter.

a. Removal of Compass Transmitter.

(1) Loosen the eight fasteners (B, fig. 2-5) that secure the plenum chamber access door to the right side of the engine inlet aft fairing.

(2) Remove the compensator (E, fig. 2-5) from the compass transmitter (para 2-28*a*).

NOTE

Tag and identify the wires to aid in replacement.

(3) Loosen and remove the six nuts and washers that secure the terminal lugs on the wires to the terminal studs on the inside top of the compass transmitter; remove the terminal lugs from the terminal studs.

(4) Loosen and remove the three screws and washers that secure the flange of the compass transmitter to the compass transmitter bracket on the boom fairing.

(5) Carefully raise and remove the compass transmitter from the compass transmitter bracket.

b. Replacement of Compass Transmitter.

(1) Carefully lower the base of the compass transmitter (E, fig. 2-5) into the opening in the compass transmitter bracket on the boom fairing, with the scribed angular marks on the flange positioned forward.

(2) Partially secure the flange of the compass transmitter to the compass transmitter bracket with three screws and washers; leave the screws loose enough to rotate the compass transmitter on the compass transmitter bracket.

(3) Rotate the compass transmitter until the center of the azimuth scale on the mounting flange parallels the longitudinal axis of the aircraft.

(4) Secure the compass transmitter in the position described in (3) above by tightening the three screws and washers.

(5) Connect and secure the six wires of the compass transmitter to the threaded terminals on the inside top of the compass transmitter; remove all identifying tags from wires.

(6) Replace the compensator on the compass transmitter (para 2-28*b*).

(7) Request support maintenance personnel to perform compensating checks and adjustments on the compass transmitter and compensator.

(8) After completion of the compensating checks and adjustments, secure the plenum chamber access door (B, fig. 2-5) to the right side of the engine inlet aft fairing with the eight fasteners.

2-30. Removal and Replacement of Slaving Switch

(C, fig. 2-10)

Removal and replacement of the slaving switch requires removal and replacement of the edgelighted switch panel assembly from the electrical console assembly.

a. Removal of Slaving Switch. Remove the edgelighted switch panel from the plate of the edgelighted switch panel assembly, the plate from the electrical console assembly, and then remove the slaving (MAGNETIC-DIR GYRO) switch from the plate (TM 55-1520-214-20).

b. Replacement of Slaving Switch. Secure and wire the slaving (MAGNETIC-DIR GYRO) switch to the plate, the plate to the electrical console assembly, and the edgelighted switch panel to the plate (TM 55-1520-214-20).

2-31. Removal and Replacement of Homing, Heading, and Bearing Indicator

(fig. 1-8)

CAUTION

Use extreme care to prevent damage to the homing, heading, and bearing indicator during removal and replacement.

a. Removal of Homing, Heading, and Bearing Indicator.

(1) Loosen and remove the horizontal screw, washer, and nut on the indicator support strap.

(2) Loosen and remove the screw and washer that secure the upper right end (not shown) of the support strap to the cockpit indicator panel assembly.

(3) Disconnect the cable from the rear of the indicator.

(4) Loosen and remove the two No. 6 screws at the upper left and lower right front of the indicator.

(5) Reach behind the cockpit indicator panel assembly and hold the indicator in place;

loosen and remove the two No. 8 screws from the front.

(6) Remove the homing, heading, and bearing indicator and the instrument clamp from the rear of the cockpit indicator panel assembly and the support strap.

b. Replacement of the Homing, Heading, and Bearing Indicator.

(1) Position the instrument clamp over the body of the indicator with *one* of the two tapped No. 8 holes located at the top right front of the indicator.

(2) Place the indicator body within the support strap behind the cockpit indicator panel assembly and position it to support the indicator while performing (3) below.

NOTE

The four mounting screws (No. 6 and 8) are passed through the cockpit indicator panel assembly and threaded into the instrument clamp.

(3) Partially secure the indicator to the rear of the cockpit indicator panel assembly using a No. 8 screw at the upper right and lower left corners.

(4) Secure the indicator to the cockpit indicator panel assembly using two No. 6 screws at the upper left and lower right corners. Tighten all four screws.

(5) Connect the proper cable to the connector on the rear of the indicator.

NOTE

A nutplate on the cockpit indicator panel assembly holds the screw and washer.

(6) Attach and secure the upper right end of the support strap to the cockpit indicator panel assembly with a screw and washer.

(7) Position the support strap to the approxicate center of the indicator; insert the screw with a washer through the center holes of the support strap. Start the nut on the screw and tighten the screw until the strap firmly supports the indicator.

2-32. Removal and Replacement of Headsets Jacks

(fig. 2-11)

a. Removal of Headset Jacks. Each headset jack is connected to two terminal block modules which are part of the headset-microphone filter assembly. Remove a headset jack as follows:

(1) Disconnect the plug of the headset-microphone from the headset jack.

(2) Note the connection points for the headset jack cord leads and label the leads.

(3) Using the insertion/extraction tool (para 2-2*a*), disconnect the cord of the headset jack from the terminal blocks; pull out all terminal block snap-in contacts of the cord from the terminal blocks.

(4) Loosen the cable straps on the mounting plate securing the cord; remove the headset jack.

b. Replacement of Headset Jacks.

(1) Using the insertion/extraction tool (para 2-2*a*), push in all the terminal block snap-in contacts of the cord to the appropriate terminals of the terminal block modules; remove the labels or tags previously placed on the leads.

(2) Secure the headset jack cord assembly to the canted frame with the cable straps on the mounting plates.

(3) Connect the plug of the headset-microphone to the headset jack.

2-33. Removal and Replacement of Headset Terminal Block TB503

(fig. 2-11)

Headset terminal block TB503 consists of seven terminal block modules on the headset-microphone filter assembly. The track of the headset-microphone filter assembly is riveted to the canted frame channel. The terminal block modules are wedged and held in place between either side of the microphone filter and ends of clamps at the outer edges of the track.

a. Removal of Headset Terminal Block Modules.

(1) Loosen the screw that secures the end of the clamp to the track just enough to relieve the wedge pressure and allow removal of the end. Slide the end rail of the clamp out of the track.

NOTE

Tag and identify each lead to aid in replacement.

(2) Using the insertion/extraction tool (para 2-2*a*), pull out all terminal block snap-in contacts connected to the terminal block modules to be removed. Remove the terminal block module.

b. Replacement of Headset Terminal Block Modules.

(1) Position the replacement terminal block

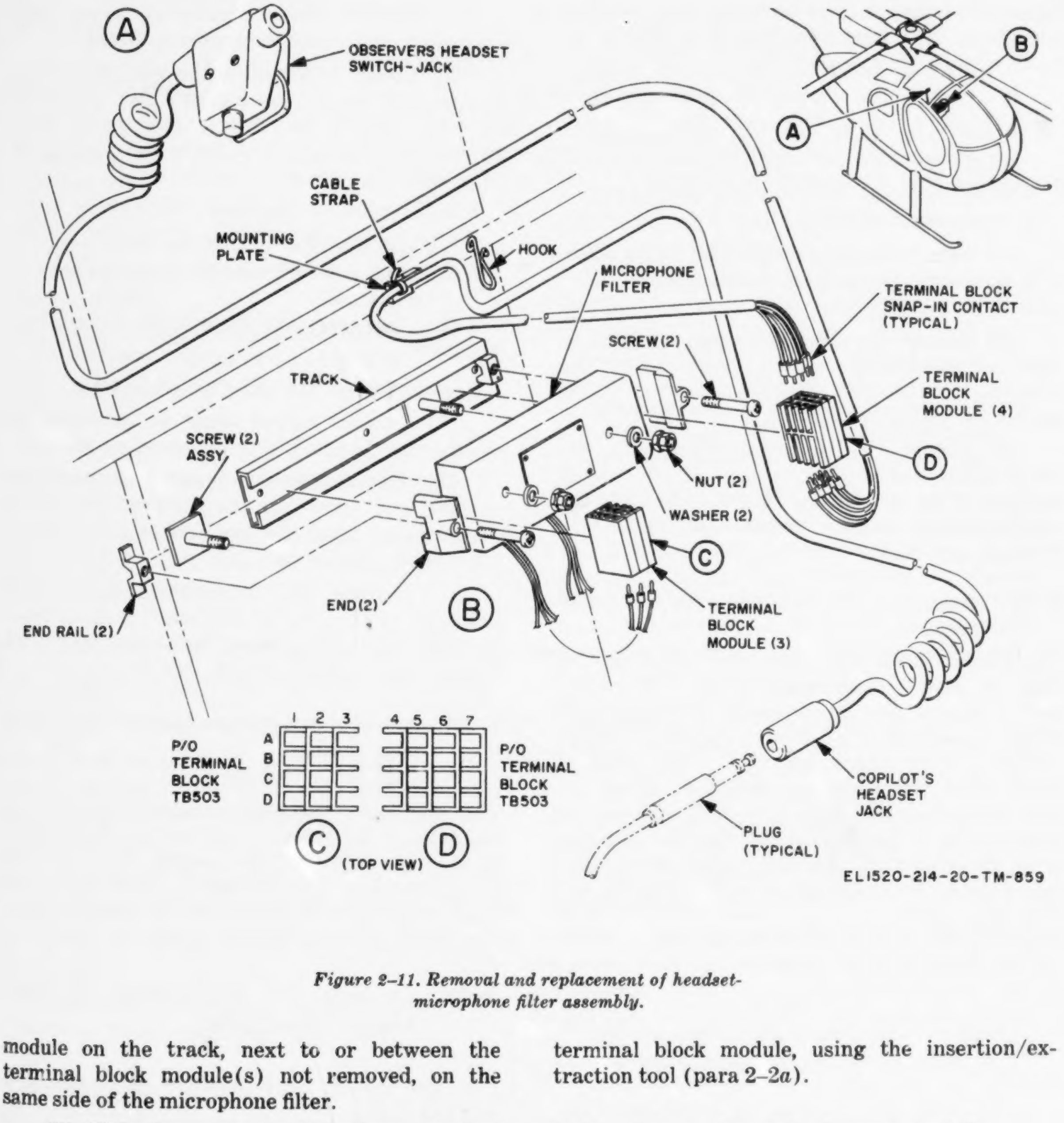

A
OBSERVERS HEADSET SWITCH-JACK
CABLE STRAP
MOUNTING PLATE
HOOK
MICROPHONE FILTER
B
A
TERMINAL BLOCK SNAP-IN CONTACT (TYPICAL)
SCREW (2)
TRACK
TERMINAL BLOCK MODULE (4)
SCREW (2) ASSY
NUT (2)
D
WASHER (2)
C
END RAIL (2)
END (2)
B
TERMINAL BLOCK MODULE (3)
1 2 3
4 5 6 7
A
B
C
D
P/O TERMINAL BLOCK TB503
P/O TERMINAL BLOCK TB503
C
(TOP VIEW)
D
COPILOT'S HEADSET JACK
PLUG (TYPICAL)
EL1520-214-20-TM-859

Figure 2-11. Removal and replacement of headset-microphone filter assembly.

module on the track, next to or between the terminal block module(s) not removed, on the same side of the microphone filter.

(2) Slide the end rail of the clamp, attached to the end, into the track until the three terminal block modules are securely wedged between the microphone filter and the end. Maintain lateral pressure on the end and tighten the end screw to secure the end rail to the track.

(3) Replace defective terminal block snap-in contacts (para 2-41).

(4) Connect all terminal block snap-in contacts to terminal openings of the replacement terminal block module, using the insertion/extraction tool (para 2-2*a*).

2-34. Removal and Replacement of the Microphone Filter

(fig. 2-10)

a. Removal of Filter. Remove the microphone filter of the headset-microphone filter assembly as follows:

NOTE

Tag and identify each lead to aid in replacement.

(1) Using the insertion/extraction tool (para 2-2*a*) pull out the terminal block snap-in contacts on the microphone filter wire leads from the terminal block modules.

(2) Loosen the screws on the ends just enough to allow sliding of each end outward.

(3) Remove the nuts and washers; lift the microphone filter off the screw assemblies.

b. Replacement of Filter.

(1) Secure the microphone filter to the track with the screw assemblies, washers, and nuts; securely tighten the nuts.

(2) Secure the terminal block modules in place by positioning the ends tight against the terminal block modules. Tighten the screws of the ends to secure the installation.

(3) Using the insertion/extraction tool (para 2-2*a*), connect the terminal block snap-in contacts of the microphone filter wire leads to the terminal block modules. Remove identifying tags from the wire leads.

2-35. Removal and Replacement of Panel Lamps

Panel lamps in the adf control unit are accessible only by partial disassembly of the adf control unit; removal and replacement of these panel lamps is performed by direct support or higher category maintenance personnel. Two types of panel lamp assemblies are used that permit organizational maintenance personnel removal and replacement of the panel lamps. The intercom controls, fm control unit and vhf receiver-transmitter use a panel light housing assembly. The uhf control unit panel lamp is covered with a panel lamp cap. Remove the panel lamps using a screwdriver, or by hand, as applicable.

CAUTION

Replace panel lamp with a lamp having the same rating as the lamp removed. Do not overtighten; damage to the control unit, cap or base, or breaking of the lamp may occur.

2-36. Removal and Replacement of Copilot's Foot Switch

(B, fig. 2-7)

Before removal and replacement of the copilot's foot switch is performed, the compartment access door assembly on the left side of the floor in the pilot's compartment must be removed to gain access to the copilot's foot switch.

a. Removal of Copilot's Foot Switch.

(1) Remove the compartment access door assembly as instructed in paragraph 2-11*a*.

(2) Loosen and remove the two screws and washers that secure the copilot's foot switch to the floor; remove the copilot's foot switch from the mounting hole in the floor and position it for access to the connecting wires.

NOTE

Tag and identify each of the wires connected to the copilot's foot switch to aid in replacement.

(3) Disconnect the wires from the copilot's foot switch.

b. Replacement of Copilot's Foot Switch.

(1) Connect tagged wires to terminals on switch; remove identifying tags from wires.

(2) Place copilot's foot switch in mounting position and secure to the floor of the pilot's compartment using the two screws and washers removed in *a*(2) above.

(3) Replace the compartment access door assembly on the floor of the pilot's compartment and the tail rotor control pedals as instructed in paragraph 2-11*a*.

2-37. Removal and Replacement of Observer's Foot Switch

(figs. 2-4 and B, fig. 2-7)

The observer's foot switch installation may be the same as the copilot's foot switch (B, fig. 2-7) or may be a cable/switch assembly (fig. 2-4) that is tied in place using a cargo tiedown strap and ring. Refer to paragraph 2-36 for applicable removal and replacement procedures.

2-38. Removal and Replacement of Radio Resistor Assemblies

(figs. 2-12 and 2-13)

a. Removal of Radio Resistor Assemblies EQ-500 and EQ501.

(1) Place BATT-OFF-EXT switch to OFF. Remove external power from the aircraft.

CAUTION

Do not attempt the following steps with external power connected; serious fires may result.

(2) Remove the electrical console cover assembly on both sides by loosening the Dzus fasteners.

(3) Remove the blank panel on top of the electrical control console by loosening the four Dzus fasteners.

(4) Unsolder the wire leads to the radio resistor assemblies.

NOTE

Tag and identify wire leads to aid in replacement.

(5) Remove the radio resistor assemblies by removing two screws, lockwashers, and washers.

b. Replacement of Radio Resistor Assemblies EQ500 and EQ501.

(1) Replace radio resistor assemblies and secure with screws, lockwashers, and washers.

(2) Resolder wire leads and remove identifying tags.

(3) Replace blank panel on top of the electrical control console and secure with the four captive Dzus fasteners.

(4) Replace the electrical console cover assembly on the pilot's side and secure with the captive Dzus fasteners.

2-39. Removal and Replacement of Radio Relays (K500, K501, K502, K503, and K505)

(figs. 2-12 and 2-13)

Removal and replacement of the radio relays requires removal of the electrical console cover assembly from both sides of the electrical control console assembly.

a. Removal of Radio Relays.

(1) Place BATT-OFF-EXT switch to OFF. Remove external power from the aircraft.

CAUTION

Do not attempt the following steps with external power connected; fires may result.

(2) For access to radio relays K500, K501, K502, and K503, remove the console cover assembly on the pilot's side of the electrical control console. For access to radio relay K505, remove the console cover assembly on the copilot's side of the eletrical control console.

(3) Remove the screws, washers, and spacers that secure the relay mounting plate to the panel assembly.

(4) Position the relay mounting plate, with the radio relays attached, for access to the soldered terminals on the underside of the radio relays.

NOTE

Tag and identify the wires to aid in replacement.

(5) Unsolder the wire leads from the terminals of the radio relay that is to be removed.

(6) Loosen and remove the two screws, washers, and nuts that secure the radio relay to the relay mounting plate.

(7) Remove the radio relay from the relay mounting plate.

b. Replacement of Radio Relays.

NOTE

The mounting brackets on the side of the radio relays K500, K501, K502, and K503 are secured to the underside of the relay mounting plate.

(1) Insert the radio relay up through the relay mounting plate and secure it to the underside of the relay mounting plate with two screws, washers, and nuts.

(2) Solder the wire leads to the radio relay and remove all identifying tags from wire leads.

NOTE

In some units the multiple relay mounting plate installation includes two 1/4-inch spacers which lower the mounting plate and prevent any possible interference with a rotary switch in the armament panel. If not installed previously, the spacers should be added at this time.

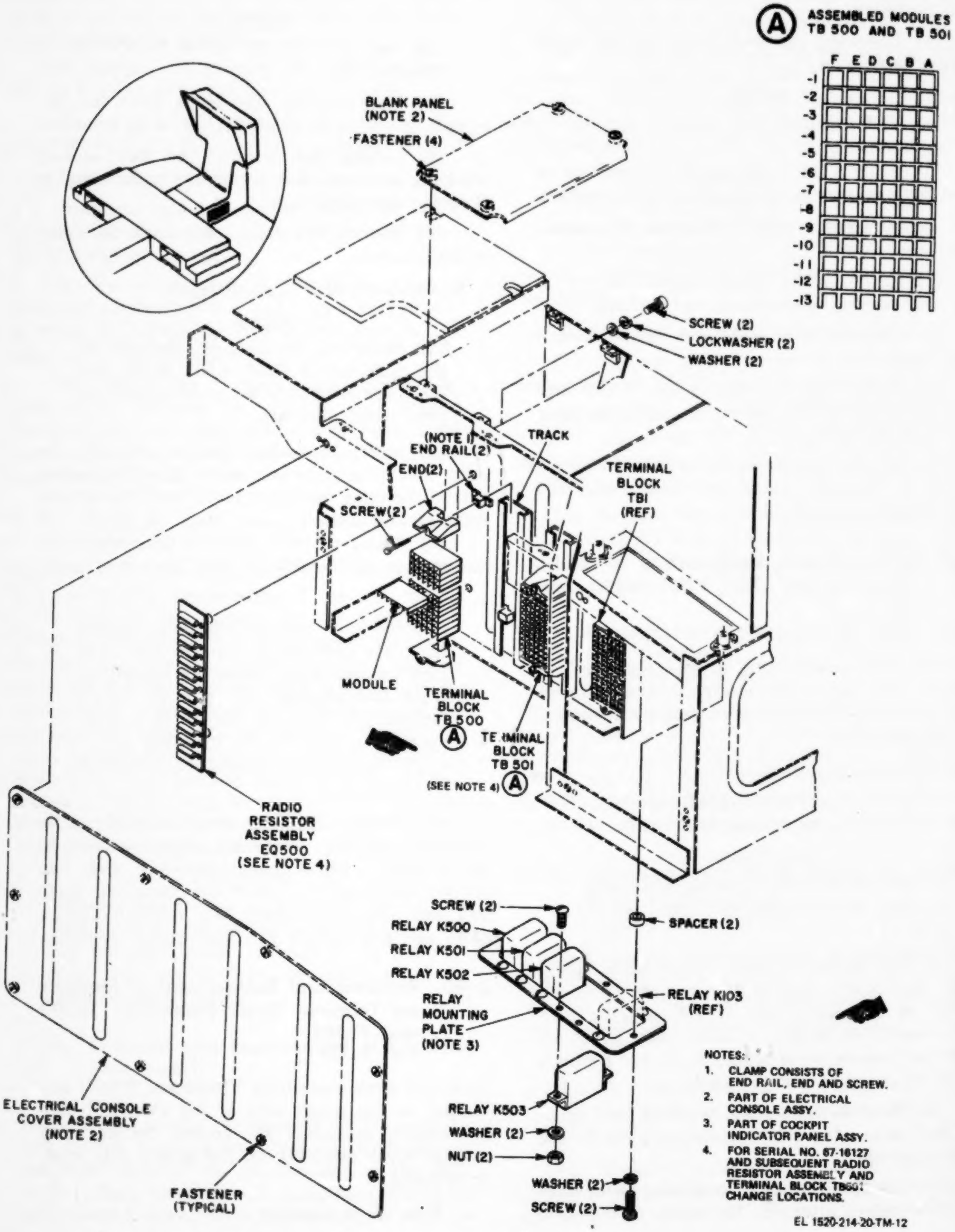
(3) Position the relay mounting plate in its mounting position; secure the mounting plate to the cockpit indicator panel assembly with two screws and washers. Insert the mounting plate and two spacers between the relay mounting plate and the cockpit indicator panel assembly.

2-40. Removal and Replacement of Modules on Terminal Block Assemblies TB500 and TB501

(fig. 2-12)

Terminal block assemblies TB500 and TB501 are located on the pilot's side of the electrical control console assembly. For access, the electrical console cover assembly on the pilot's side must be removed.

a. Removal of Modules.


Ⓐ ASSEMBLED MODULES TB 500 AND TB 501
F E D C B A
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
-13
BLANK PANEL (NOTE 2)
FASTENER (4)
SCREW (2)
LOCKWASHER (2)
WASHER (2)
(NOTE 1) END RAIL(2)
TRACK
END(2)
SCREW(2)
TERMINAL BLOCK TB1 (REF)
MODULE
TERMINAL BLOCK TB500 Ⓐ
TERMINAL BLOCK TB 501 (SEE NOTE 4) Ⓐ
RADIO RESISTOR ASSEMBLY EQ500 (SEE NOTE 4)
SCREW (2)
RELAY K500
RELAY K501
RELAY K502
RELAY MOUNTING PLATE (NOTE 3)
SPACER (2)
RELAY K103 (REF)
ELECTRICAL CONSOLE COVER ASSEMBLY (NOTE 2)
FASTENER (TYPICAL)
RELAY K503
WASHER (2)
NUT (2)
WASHER (2)
SCREW (2)
EL 1520-214-20-TM-12

NOTES:

1. CLAMP CONSISTS OF END RAIL, END AND SCREW.
2. PART OF ELECTRICAL CONSOLE ASSY.
3. PART OF COCKPIT INDICATOR PANEL ASSY.
4. FOR SERIAL NO. 67-16127 AND SUBSEQUENT RADIO RESISTOR ASSEMBLY AND TERMINAL BLOCK TB501 CHANGE LOCATIONS.

Figure 2-12. Installation of radio resistor assembly, radio relays and terminal block assemblies.

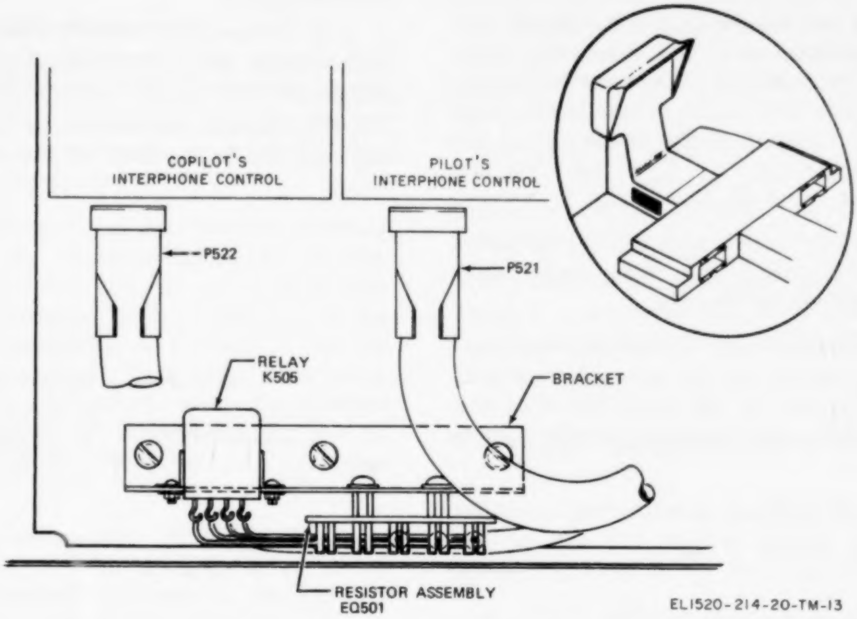


Figure 2-13. Observer's control assembly; radio resistor assembly EQ501 and relay K505.

(1) Loosen the nine captive fasteners and remove the electrical console cover assembly from the pilot's side of the electrical control console assembly.

NOTE

Tag and identify all wires that are to be disconnected from modules of the terminal block assemblies.

(2) Using the insertion/extraction tool (para 2-2*a*), pull out the terminal block snap-in contacts from the block assembly module that is to be replaced.

(3) Loosen the screw that secures the end and end rail holding the modules on the track; slide the end rail away from the modules and off the track.

(4) Remove the module from the terminal block assembly.

b. Replacement of Modules.

(1) Place the module on the terminal block assembly in its correct mounting position, between or next to the modules not removed.

(2) Slide the end rail of the clamp on the track. Position the end against the outside module and fasten the end to the end rail with the screw. While pressing the end against the outside module of the terminal block assembly, tighten the screw and secure the terminal block assembly modules to the track.

(3) Using the insertion/extraction tool (para 2-2*a*), push in all terminal block snap-in contacts into terminal openings of the replaced module; remove the identifying tags from the wires.

(4) Replace the defective terminal block snap-in contacts (para 2-41).

(5) Replace the electrical console cover assembly and secure the cover assembly with the nine captive fasteners.

2-41. Replacement of Terminal Block Snap-In Contacts

(fig. 2-14)

Terminal block snap-in contacts, installed on the terminal leads of the wiring harness, are used to physically and electrically connect the leads to the terminal block modules. Replace defective contacts as follows:

a. Strip the insulation 11/64 inch from the end of the wire (para 2-40) using applicable tools.

b. Insert the stripped end of the wire into the terminal block snap-in contact (Burndy part

No. PCM22M-H1 for 22 gauge wire, or No. PCM20M-H2 for 20 gauge wire); look through the inspection hole and insure that the stripped end of the wire extends past the inspection hole. Make sure the stripped end of the wire is inserted as far as possible into the terminal block snap-in contact; also insure that the insulation on the wire extends approximately 1/16 inch into the shoulder of the terminal block snap-in contact.

c. Using a crimping tool with the proper dieset and stop bushing (para 2-2*a*), crimp the terminal block snap-in contact on the wire.

d. Visually inspect and check the terminal block snap-in contact on the wire; insure that it is firmly attached to the wire and that the stripped end of the wire extends past the inspection hole.

e. Using the insertion/extraction tool, push the terminal block snap-in contact into the proper terminal of the terminal block assembly (para 2-33 or 2-40).

2-42. Removal and Replacement of Mountings

The uhf and fm radio set mountings, and adf receiver mounting, and the vhf amplifier-power supply mounting are located in the pilot's compartment lower section electronics compartment. Procedures for removal and replacement of these mountings follow:

a. Removal of Mounting.

(1) Remove the tail rotor control pedals and floor compartment access door assembly from the left front (or right front, as applicable) of the pilot's compartment for access to the equipment and the mounting that is to be removed (para 2-11*a*).

(2) Remove the equipment installed on the mounting; refer to the applicable paragraphs for instructions.

(3) Observe and note the attachment points for existing ground straps, terminal lugs of wires, and similar items attached to the mounting. Tag and identify all wires and record attachment locations as an aid for replacement.

(4) Loosen and remove all hardware that attaches ground straps, wires, and similar items to the mounting.

(5) Loosen and remove mounting screws, lockwashers, washers (figs. 2-2, 2-3, A, fig. 2-6, B or D, fig. 2-7, or A, fig. 2-8) and attaching hardware that secures the mounting to the aircraft structure.

(6) Loosen and remove attaching hardware that secures any connectors to the mounting; remove connectors from the mounting.

(7) Remove the mounting through the access opening in the floor of the pilot's compartment.

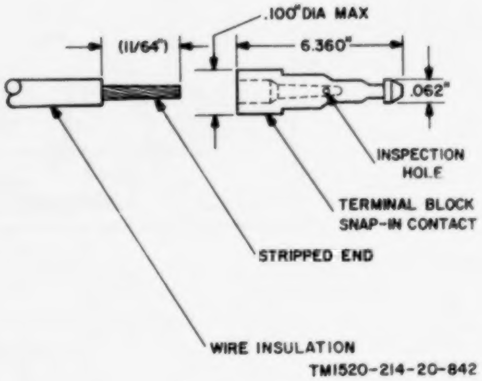


Figure 2-14. Replacement of terminal block snap-in contacts.

b. Replacement of Mounting.

(1) Place the mounting in its approximate mounting position inside the lower section electronic compartment.

(2) Attach and secure any connector(s), for which mounting provisions exist, on the mounting with attaching hardware.

(3) Attach and secure ground straps, wires, and all other similar items to the mounting with attaching hardware; remove all identifying tags from wires.

(4) Secure the mounting to the aircraft structure using mounting screws, lockwashers, washers (figs. 2-2; 2-3; A, fig. 2-6; B or D, fig. 2-7; or A, fig. 2-8) and all other attaching hardware.

(5) Replace the equipment on the mounting. Refer to the applicable paragraphs for instructions.

(6) Replace the compartment access door assembly and the two tail rotor control pedals (para 2-11*d*).

Section V. ADJUSTMENTS AFTER REPLACEMENT

2-43. Extent of Adjustments

Perform the following adjustments whenever the equipment is installed in the aircraft after repair or after the scheduled periodic pullout checks and before performing further maintenance checks and operation.

a. Fm Communications and Homing Facility. Whenever the fm receiver-transmitter, fm control unit, fm antenna coupler, fm homing loop balun, or the fiberglass center canopy (TM 55-1520-214-20) containing a portion of the fm communications antenna have been installed or repaired, the SQ ADJ control of the fm receiver-transmitter must be adjusted. To adjust the SQ ADJ control, follow procedures given in paragraph 2-44.

b. Uhf Communication Facility. Whenever the uhf control unit has been installed or repaired, channels must be preset on the uhf control unit. Refer to paragraph 2-45 for information on presetting channels.

c. Heading Reference Facility. After each periodic pullout inspection, or removal and replacement of the compensator (fig. 1-6) or the compass transmitter, request direct support or higher category maintenance personnel to perform compensation procedures for the heading reference facility.

2-44. Fm Facility Squelch Adjustment

To adjust the squelch circuit of the fm receiver-transmitter, remove the left-hand compartment access door (para 2-11*a*) and proceed as follows:

a. Disconnect the fm antenna cable (A, fig. 2-7) from the fm antenna coupler, this disconnects the fm communications antenna.

b. Perform the starting procedures in paragraph 2-7, sequences No. 17, 18, 37, and 38.

c. Set the mode control on the fm control unit (fig. 1-4) to PTT.

d. Set the SQUELCH control on the FM control unit to CARR.

e. With the SQ ADJ control on the fm receiver-transmitter turned fully counterclockwise, adjust the VOL control on the FM control unit for a comfortable level of background noise as heard in the headset-microphones.

f. Rotate the SQ ADJ control on the fm receiver-transmitter clockwise until the background noise just cuts out. Do not rotate the control beyond this point.

g. Check the squelch setting on several frequencies. If all selected frequencies are not fully squelched, rotate the SQ ADJ control slightly clockwise.

h. Perform the stopping procedures in paragraph 2-7, sequences No. 58 and 59, and connect the fm antenna cable to the fm antenna coupler (A, fig. 2-7).

2-45. Uhf Communication Facility Channel Presetting

Perform the following procedure to preset channels on the uhf control unit to a desired frequency:

a. Loosen the two holddown screws (fig. 1-2) in the memory drum access door and open the door.

b. Turn the preset channel control to the channel to be preset as indicated on the *right* side of the memory drum. Disregard the channel number shown in the preset channel indicator; this is not the channel being preset.

c. Using the preset tool mounted in the memory drum access area, move the eight adjustable pins according to designation and letter code on the access door cover to preset the channels to a desired frequency. The three center digits (252) are selected with two pins for each number according to the letter code on the access door cover. The hundreds digit (2 or 3) and the hundredths digit (0 to 5) are selected by a single pin for either digit as designated on the control.

NOTE

> Make certain that the adjustable pins are firmly seated before rotating the memory drum to the next channel.

d. Record the channel frequencies on the chart provided on the front of the memory drum access door in accordance with the channel indicated on the *right* side of the memory drum.

e. Replace the preset tool in its holder.

f. Close the memory drum access door and tighten the two holddown screws.

2-46. Interphone Checkout Procedures

Perform the following procedures to insure proper interphone operation after system repair is accomplished. *If a headset-microphone is connected* into the interphone system, *it must be worn* by the testing personnel during the following procedures to eliminate possible feedback interference.

a. Set the intercom control switches as follows:

(1) Receiver switches to OFF (down position).

(2) Function switches to INT.

(3) Volume controls set at midrange.

b. Place the radio set circuit breakers UHF/VHF, FM, and ADF to the OFF position.

c. Communicate between pilot, copilot, and observer positions. Communications should be clear; sidetone should be a comfortable level, and no instability (howling or squealing) should be noted.

d. Activate the radio set circuit breakers (*b* above) and establish communications over each radio, in turn. Communications should be clear with good sidetone, and no instability.

2-47. Fm Communication Antenna System Checkout Procedure

Perform the following procedures to insure proper operation of the fm communication antenna system whenever improper operation is suspected and after repairs of the system have been accomplished.

a. Remove the RF antenna cable from the fm antenna coupler connector (AA, fig. 2-7).

b. Connect a thruline wattmeter (AN/URM-120 or equivalent) between the RF antenna cable and the fm antenna coupler connector.

c. Set the fm radio set for 53-MHz operation and set the copilot's intercom control function switch to position 1.

d. Using the copilot's foot switch, key the fm radio set and observe the antenna voltage standing wave ratio (vswr) using the thruline wattmeter. The vswr should be no greater than 5:1.

e. Remove the dc power from the fm radio set; disconnect the thruline wattmeter; and reconnect the fm communication antenna system.

CHAPTER 3

CONFIGURATION FUNCTIONAL DESCRIPTION

3-1. Description of Configuration
(fig. 5-1)

a. The basic electronic equipment items, installation items, and ancillary equipment make up the aircraft electronic configuration are used in different combinations within three separate systems to perform six distinct functions: interphone communications, fm communications and homing, uhf communications, vhf communications, automatic direction finding (in the low-frequency ranges and broadcast bands), and heading reference. The three separate systems in the electronic configuration are the communication, navigation, and intercommunication systems. These systems are described in paragraph 3-2. The functions, or facilities, within each system are discussed in paragraphs 3-4 through 3-9. A functional description of the installation items is presented in paragraph 3-3. For the functional description of the ancillary equipment, refer to chapter 4.

b. Power to the electronic configuration is supplied through the aircraft dc main bus and power control circuits in the electrical system. When the aircraft engine is not operating, the required dc power is supplied by the aircraft battery. A static inverter converts dc power to ac power (26 vac, 400 Hz) for use by the heading reference facility of the navigation system (para 3-2) and the attitude gyro (part of the aircraft electrical system). On some configurations (para 1-7), a second static inverter serves as a standby source of ac power for the attitude gyro in case of failure of the primary static inverter.

3-2. Configuration and Systems

Functionally, the electronic configuration (fig. 5-1) comprises the communication, navigation, and intercommunication systems, with each system containing its own applicable facilities. The intercommunication system provides a facility which is common to the communication and navigation systems: the selection of desired functions of the communication and navigation systems by the pilot, copilot, or observer.

a. Communication System. The communication system provides air-to-air and air-to-ground communication for the pilot, copilot, and observer. Two separate facilities make up the communication system: the fm communication and homing facility and a vhf or uhf communication facility. The use of either the vhf communication facility or the uhf communication facility depends upon the theater of operation in which the aircraft is employed (para 1-7). The fm and AM vhf and uhf communication facilities are line-of-sight limited and provide increased communication ranges at higher altitudes. The pilot, copilot or observer may select the desired facility with his intercom control. For the signal characteristics and a functional description of the communications portion of the fm communication and homing facility, the uhf communication facility, and the vhf communication facility, refer to paragraphs 3-5, 3-6, and 3-7, respectively.

b. Navigation System. The navigation system permits the pilot and copilot to determine the position and location of the aircraft in relation to fm vhf radio stations and AM broadcast/navigation band radio stations and also in relation to the earth's magnetic field. The navigation system consists of the homing portion of the fm communication and homing facility (para 3-5), the direction finder facility (para 3-8), and the heading reference facility (para 3-9). A visual display of the homing, heading, and bearing is indicated on the homing, heading, and bearing indicator (fig. 1-8). An audio signal from the direction finder facility may be selected by the pilot, or copilot, or observer to identify the radio station being monitored. Selection of the desired function of the communication and navigation systems are provided by selector switches (fig. 1-7) on the pilot's, and observer's intercom control units. For a description of the fm homing facility (fig. 5-1), direction finder facility, and heading reference facility, refer to paragraphs 3-5, 3-8, and 3-9, respectively.

c. Intercommunication System. The intercommunication system provides two-way interphone communication between the pilot, copilot, and observer. In addition, the intercommunication system permits the pilot, copilot, or observer to monitor receiver audio signals from the uhf communication facility, or the alternate vhf communication facility, (para 1-7), the fm communication and homing facility, and the direction finder facility. Both hot-mike and push-to-talk modes of operation are available for interphone communication. Push-to-talk operation requires the pilot, copilot, or observer to actuate hand-operated switches for interphone communication; or the copilot and observer to operate a foot-actuated switch. Hot-mike operation permits interphone communication without the necessity of actuating hand-operated switches, or the foot-operated switches, prior to talking. Selection of hot-mike or push-to-talk operation is a function of the interphone facility. Refer to paragraph 3-4 for a functional discussion of the interphone facility.

3-3. Installation Items

The electronics configuration includes numerous installation items (para 1-6*b*): four antennas, an adf receiver mounting, the fm antenna coupler, two homing loop baluns, a uhf/vhf matching unit, an adf antenna cable, two radio resistor assemblies, headset jacks, a headset-microphone filter assembly, terminal blocks, interphone and radio relays, hand- and foot-operated switches. The functions of these installation items are as follows:

a. Antennas. The four installation item antennas in the electronic configuration are the uhf/vhf antenna, the adf sense antenna, the fm communications antenna, and the fm homing antenna. The uhf/vhf antenna is used for both transmitting and receiving either by the uhf communication facility or by the alternate vhf communications facility (para 1-7). The adf sense antenna is used by the direction finder facility. Depending on operating mode, it can be used to provide the facility with signals for standard AM broadcast reception or with a reference signal which permits the adf system to eliminate ambiguities normally caused by the double null in loop antenna patterns. The fm communications and homing antennas are both used by the fm communication and homing facility. The communications antenna is used for transmitting and receiving voice communications and the homing antenna, which is highly directional, is used for receiving only and allows the transmitting fm station to be used as a homing beacon.

b. Adf Receiver Mounting. The direction finder facility (fig. 5-1) includes an adf receiver mounting (fig. 1-5) which contains a dc-to-ac inverter. The dc-to-ac inverter converts 28 vdc power to ac power (115 vac, 400 Hz) for operation of the direction finder facility. The mounting is also a connection and distribution point for ac and dc power and control and audio signals within the direction finder facility. In addition, the adf receiver mounting supports and secures the adf receiver (fig. 2-8).

c. Fm Antenna Coupler. The fm antenna coupler (fig. 1-9) provides impedance matching, the RF signal coupling between the fm receiver-transmitter and the fm communications antenna of the fm communications and homing facility.

d. Homing Transformers. The homing transformers (fig. 1-9) are used to couple the upper and lower elements of the two fm homing antenna dipoles to the inputs of the hybrid network.

e. Hybrid Network. The hybrid network (fig. 1-9) is used to create a 90-degree phase differential between the two signals from the fm homing antenna dipoles to prevent crosstalk interference between them in the fm receiver.

f. Uhf/Vhf Matching Unit. The uhf/vhf matching unit (fig. 1-10) provides impedance matching and couples RF signals between the uhf radio set (or the alternate vhf radio set) and the uhf/vhf antenna.

g. Radio Resistor Assemblies (figs. 1-12 and 5-1). The radio resistor assemblies provide impedance matching and termination for audio circuits in the electronic configuration.

h. Headset Jacks (figs. 1-12 and 5-1). The pilot's and copilot's headset jacks, and observer's headset switch-jack, transfer audio signals between headset-microphones and the interphone facility for interphone and communications operation.

i. Headset-Microphone Filter Assembly. The microphone filter (figs. 1-12 and 5-1), of the headset-microphone filter assembly is used in the electronic configuration to filter noise and other objectional signals from microphone audio circuits.

j. Terminal Blocks (fig. 1-12). The terminal blocks interconnect, and provide bussing and distribution points of the power, control, and audio circuits for the electronic configuration.

k. Interphone and Radio Relays. Pilot's and copilot's interphone relays (figs. 2-12 and 5-1) are used to apply interphone and amplifier control signals to the pilot's and copilot's intercom controls, respectively, for interphone communication when using the interphone facility. In addition, the pilot's and copilot's interphone relays perform the same functions for the uhf or vhf communication facility, and the fm communication and homing facility for radio communications. Pilot's, copilot's and observer's transmit relays (figs. 2-12 and 2-13) control application of transmit control signals to the pilot's, copilot's and observer's intercom controls for keying selected radio transmitters.

l. Hand- and Foot-Operated Switches. Hand- and foot-operated switches control transmitter keying for radio communications and microphone operation. Pilot's and copilot's RADIO-ICS switches (figs. 2-1 and 5-1) control the pilot and copilot interphone and transmit relays described in *m* below. The pushbutton switch of of the observer's headset switch-jack (fig. 1-12) controls the observer's transmit relay (fig. 2-13). The copilot's and observer's foot switches (figs. 2-7 and 2-4), in conjunction with the respective intercom controls, control the energizating of the interphone and transmit relays (fig. 5-1 and 2-13) for both radio communication and interphone operation.

3-4. Interphone Facility
(fig. 3-1)

The pilot's, copilot's, and observer's intercom controls (fig. 3-1) are identical. They select, amplify, and control audio signal transmission and reception. A discussion of the manner in which these functions are accomplished follows.

a. Power Control and Distribution. Power is supplied to the interphone facility from the aircraft electrical system. When the AIC circuit breaker (part of the electrical system) is closed, dc power (27.5 vdc) is applied to the intercom controls. The RADIO OFF-BRT switch-rheostat (fig. 2-1) dims and controls the intensity of the intercom controls panel lights when the INST LT circuit breaker is closed.

b. Operational Control and Audio. Each intercom control in the aircraft interphone facility selects, amplifies, and directs an audio signal to a headset. Within the electronic configuration, the audio signal may be derived from the uhf or vhf communication facility (whichever is applicable), the fm communication and homing facility, the adf facility, or from a microphone. Since the intercom controls are interconnected by the interphone line, an audio signal can also be transferred from one intercom control to the other.

(1) *Hot-mike interphone communication.* The transmit-interphone selector switch of each intercom control may be set to two positions applicable to the intercommunication system: INT and PVT. With the selector switch set to PVT, the interphone facility operates in the hot-mike intercommunication mode (para 3-2*c*). In the hot-mike mode, the intercom controls provide a direct path for audio signals from three microphones (pilot's copilot's, and observer's), to reach three headsets (pilot's, copilot's, and observer's), without operation of hand- or foot-operated switches. These audio signals are filtered through the headset-microphone filter assembly before reaching the intercom controls for amplification and routing to the headsets through the interphone line. The private interphone line transfers audio signals only for hot-mike operation.

(2) *Push-to-talk interphone communication.* With the selector switch of the intercom controls set to INT, the audio circuits that include the three microphones remain open until talk amplifier and interphone control signals are applied to the intercom controls. These control signals are present only when the pilot's RADIO-ICS switch, the copilot's RADIO-ICS switch, the observer's transmit switch (on the observer's headset switchjack), the copilot's foot switch or the observer's foot switch is actuated. (See figs. 1-1 and 2-1 for the location of these switches.) Actuation of any of these switches energizes the corresponding relay or relays which transfer the control signals to the intercom controls, in which case the intercom controls provide a path with amplification for the audio signals from one of the three microphones (pilot's, copilot's, or observer's) to the three headsets in the interphone facility.

(3) *Engine power out warning.* The output of the engine power out warning control unit of the aircraft electrical system is connected to the audio circuit of the pilot's and copilot's headsets to provide an audible warning signal indicating low turbine rpm or engine failure. The two-channel audio amplifier, a unit of the aircraft electrical system (TM 55-1520-214-20), amplifies the engine warning out signal.

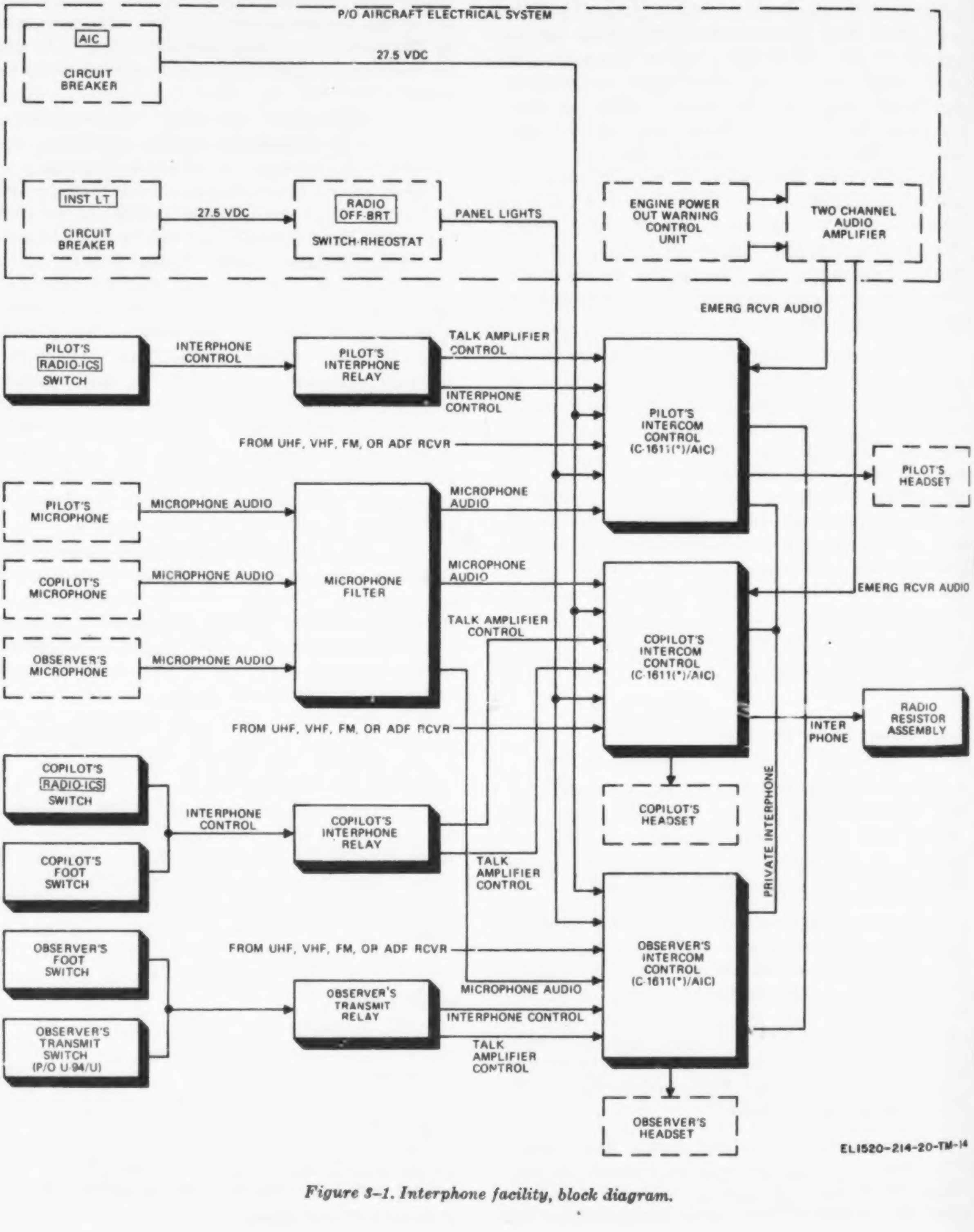

P/O AIRCRAFT ELECTRICAL SYSTEM
AIC
CIRCUIT BREAKER
27.5 VDC
INST LT
CIRCUIT BREAKER
27.5 VDC
RADIO OFF-BRT
SWITCH-RHEOSTAT
PANEL LIGHTS
ENGINE POWER OUT WARNING CONTROL UNIT
TWO CHANNEL AUDIO AMPLIFIER
EMERG RCVR AUDIO
PILOT'S RADIO-ICS SWITCH
INTERPHONE CONTROL
PILOT'S INTERPHONE RELAY
TALK AMPLIFIER CONTROL
INTERPHONE CONTROL
PILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
FROM UHF, VHF, FM, OR ADF RCVR
PILOT'S HEADSET
PILOT'S MICROPHONE
MICROPHONE AUDIO
MICROPHONE AUDIO
COPILOT'S MICROPHONE
MICROPHONE AUDIO
MICROPHONE FILTER
MICROPHONE AUDIO
EMERG RCVR AUDIO
OBSERVER'S MICROPHONE
MICROPHONE AUDIO
TALK AMPLIFIER CONTROL
COPILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
FROM UHF, VHF, FM, OR ADF RCVR
INTER PHONE
RADIO RESISTOR ASSEMBLY
COPILOT'S RADIO-ICS SWITCH
INTERPHONE CONTROL
COPILOT'S INTERPHONE RELAY
COPILOT'S HEADSET
PRIVATE INTERPHONE
COPILOT'S FOOT SWITCH
TALK AMPLIFIER CONTROL
OBSERVER'S FOOT SWITCH
FROM UHF, VHF, FM, OR ADF RCVR
OBSERVER'S INTERCOM CONTROL (C-1611(*)/AIC)
MICROPHONE AUDIO
OBSERVER'S TRANSMIT RELAY
INTERPHONE CONTROL
OBSERVER'S TRANSMIT SWITCH (P/O U-94/U)
TALK AMPLIFIER CONTROL
OBSERVER'S HEADSET
EL1520-214-20-TM-14

Figure 3-1. Interphone facility, block diagram.

3-5. Fm Communication and Homing Facility

The fm communication and homing facility (fig. 3-2) comprises the fm communications antenna and the fm antenna coupler, the fm homing antenna, homing transformers, and hybrid network, the fm receiver-transmitter, the fm control unit, the fm homing displays in the homing, heading, and bearing indicator, and the interphone facility units. The fm communication and homing facility provides two-way voice radio communication and homing on RF signals, on 800 selectable channels in the frequency range of 30.00 to 69.95 MHz. The fm communication portion of the facility uses the fm communications antenna and the fm antenna coupler, the fm receiver-transmitter and fm control unit, and the interphone facility units for performance of its function (two-way voice radio communication). The homing portion of the facility uses the fm homing antenna, homing transformers, hybrid network, the fm receiver, control unit, and the homing meter in the homing, heading, and bearing indicator to provide the pilot with a visual navigation aid.

a. Power Control and Distribution. Power to the fm communication and homing facility is supplied from the aircraft electrical system through three independent circuit breakers (INST LT, AIC, and FM). When the AIC circuit breaker is closed, dc power (27.5 vdc) is applied to the pilot's, copilot's, and observer's intercom controls. The fm circuit breaker, when closed, allows 27.5 vdc to be applied to the fm control unit, for routing to the fm antenna coupler and the fm receiver-transmitter. The INST LT circuit breaker transfers 27.5 vdc to the RADIO OFF-BRT switch rheostat which controls the intensity of panel lights in the fm control unit.

b. Operational Control and Audio. The transmit-interphone selector switch of each intercom control may be set to any one of six positions (1, 2, 3, 4, INT, and PVT). The INT and PVT settings are applicable to the interphone facility only. In the fm communication adf homing facility, the transmit-interphone selector switch of either intercom control is set to 1 for two-way radio communication.

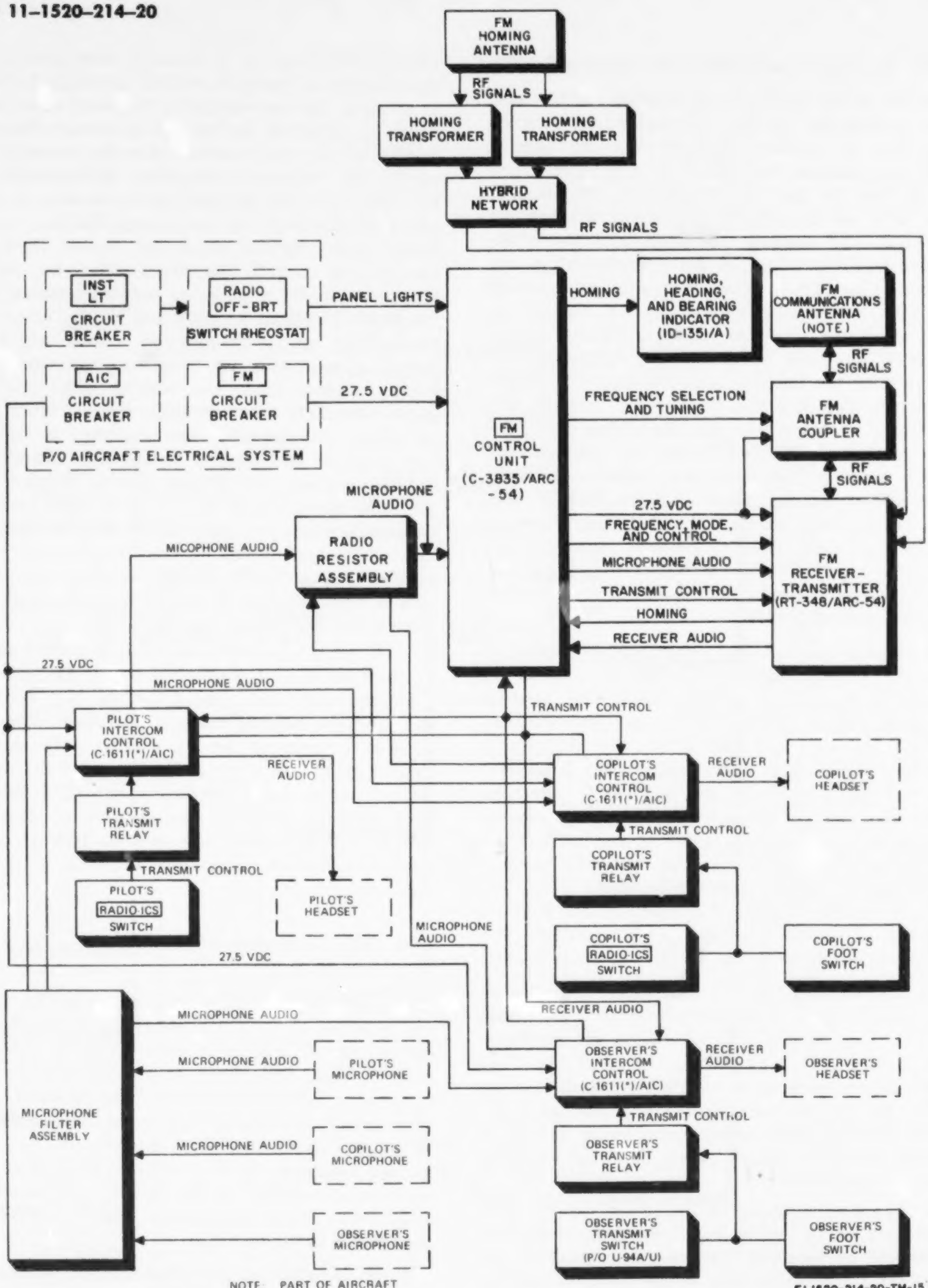
(1) *Fm communications.* With the fm control unit set to the desired frequency, audio signals will be received from a ground station (or another aircraft) as long as the intercom control transmit-interphone selector switch is set to position 1. To transmit, the pilot, copilot, or observer must actuate a hand- or foot-operated switch (RADIO-ICS, copilot or observer foot switch, or the observer's transmit switch) available to him to energize the corresponding transmit relay and provide a transmit control signal through the appropriate intercom control to key the transmitter of the fm receiver-transmitter. Simultaneously, the receiver of the fm receiver-transmitter is disabled and the intercom control amplifies the microphone audio signals which are routed through the control unit to the transmitter for radio transmission. RF signals are coupled between the fm communications antenna and the fm receiver-transmitter by the fm antenna coupler which is tuned automatically by frequency selection and tuning signals from the control unit. During radio reception, receiver audio signals from the fm receiver-transmitter are amplified by intercom controls and applied to headsets. Should it become necessary for the operator to switch from the fm communication facility to another facility of the electronic configuration (rotate the transmit-interphone selector switch from position 1 to another), receiving of the fm receiver audio signals is accomplished by positioning the intercom control RECEIVERS 1 switch to ON.

(2) *Homing.* With the mode control switch on the control unit positioned to HOME, the fm communication and homing facility (fig. 3-2) is placed in the homing mode of operation. The RF signals received by the fm homing antenna are coupled to the receiver of the fm receiver-transmitter, where they are processed, and routed back through the fm control unit as homing signals which deflect the station passage and steering meters in the homing, heading, and bearing indicator (fig. 1-8).

3-6. Uhf Communication Facility
(fig. 3-3)

The uhf communication facility uses the uhf/vhf antenna, uhf/vhf matching unit, and reflectometer, the uhf/vhf receiver-transmitter, the uhf control unit, and those units common to the interphone facility. The uhf facility provides two-way voice radio communication, amplitude-modulated, on 3,500 selectable channels in the frequency range of 225.00 to 399.95 MHz. The uhf receiver-transmitter in the facility also provides a 238.00 to 248.00 MHz guard receiver normally fixed tuned to 243.00 MHz.

a. Power Control and Distribution. Power to the uhf facility is supplied from the aircraft electrical system through three circuit breakers (INST LT, AIC, and UHF/VHF). The UHF/


FM HOMING ANTENNA
RF SIGNALS
HOMING TRANSFORMER
HOMING TRANSFORMER
HYBRID NETWORK
RF SIGNALS
INST LT
CIRCUIT BREAKER
RADIO OFF-BRT
SWITCH RHEOSTAT
PANEL LIGHTS
AIC
CIRCUIT BREAKER
FM
CIRCUIT BREAKER
27.5 VDC
P/O AIRCRAFT ELECTRICAL SYSTEM
FM
CONTROL UNIT
(C-3835/ARC-54)
HOMING
HOMING, HEADING, AND BEARING INDICATOR (ID-1351/A)
FM COMMUNICATIONS ANTENNA (NOTE)
RF SIGNALS
FREQUENCY SELECTION AND TUNING
FM ANTENNA COUPLER
RF SIGNALS
MICROPHONE AUDIO
MICOPHONE AUDIO
RADIO RESISTOR ASSEMBLY
27.5 VDC
FREQUENCY, MODE, AND CONTROL
MICROPHONE AUDIO
TRANSMIT CONTROL
HOMING
RECEIVER AUDIO
FM RECEIVER-TRANSMITTER (RT-348/ARC-54)
27.5 VDC
MICROPHONE AUDIO
TRANSMIT CONTROL
PILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S HEADSET
PILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
PILOT'S RADIO-ICS SWITCH
TRANSMIT CONTROL
PILOT'S HEADSET
COPILOT'S TRANSMIT RELAY
MICROPHONE AUDIO
COPILOT'S RADIO-ICS SWITCH
COPILOT'S FOOT SWITCH
27.5 VDC
RECEIVER AUDIO
MICROPHONE AUDIO
OBSERVER'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
OBSERVER'S HEADSET
MICROPHONE AUDIO
PILOT'S MICROPHONE
MICROPHONE FILTER ASSEMBLY
TRANSMIT CONTROL
OBSERVER'S TRANSMIT RELAY
MICROPHONE AUDIO
COPILOT'S MICROPHONE
OBSERVER'S MICROPHONE
OBSERVER'S TRANSMIT SWITCH (P/O U-94A/U)
OBSERVER'S FOOT SWITCH
EL1520-214-20-TM-15

NOTE: PART OF AIRCRAFT STRUCTURE.

Figure 3-2. Fm communication and homing facility, block diagram.

VHF circuit breaker, when closed, allows dc power (27.5 vdc) to be applied to the uhf receiver-transmitter. The INST LT and AIC circuit breakers perform the same functions as in the case of the fm communication and homing facility (para 3-5*a*).

b. Operational Control and Audio. With the uhf control unit tuned to the desired frequency, amplitude-modulated audio signals will be received from a ground station (or another aircraft) as long as the transmit-interphone selector switch on the intercom control (pilot's, copilot's, or observer's) is set to position 2 or the RECEIVERS 2 switch is positioned to ON. To transmit, the operator must actuate a hand or foot operated switch (RADIO-ICS, copilot's or observer's foot switch, or the observer's transmit switch) available to him to energize the corresponding transmit relay. This furnishes a transmit control signal that activates transmitting circuits, and disables receiving circuits in the receiver-transmitter. The uhf/vhf matching unit matches impedances and couples RF signals between the uhf/vhf antenna and the reflectometer.

3-7. Vhf Communication Facility
(fig. 3-4)

The vhf communication facility, alternate to the uhf communications facility in the electronic configuration, uses the uhf/vhf antenna, uhf/vhf matching unit, vhf receiver-transmitter, amplifier-power supply and those units common to the interphone facility and all communications facilities. The vhf facility provides two-way voice radio communication, amplitude modulated, on 360 selectable channels in the frequency range of 118.00 to 135.95 MHz in 50-kHz steps.

a. Power Control and Distribution. Power to the vhf communication facility is available when three circuit breakers (INST LT, AIC, and UHF/VHF) are closed. The INST LT and AIC circuit breakers perform the same functions as in the case of the uhf communication facility and the fm communication and homing facility (para 3-5*a*). In the vhf communication facility, the UHF/VHF circuit breaker transfers dc power (27.5 vdc) from the aircraft electrical system to the vhf receiver-transmitter.

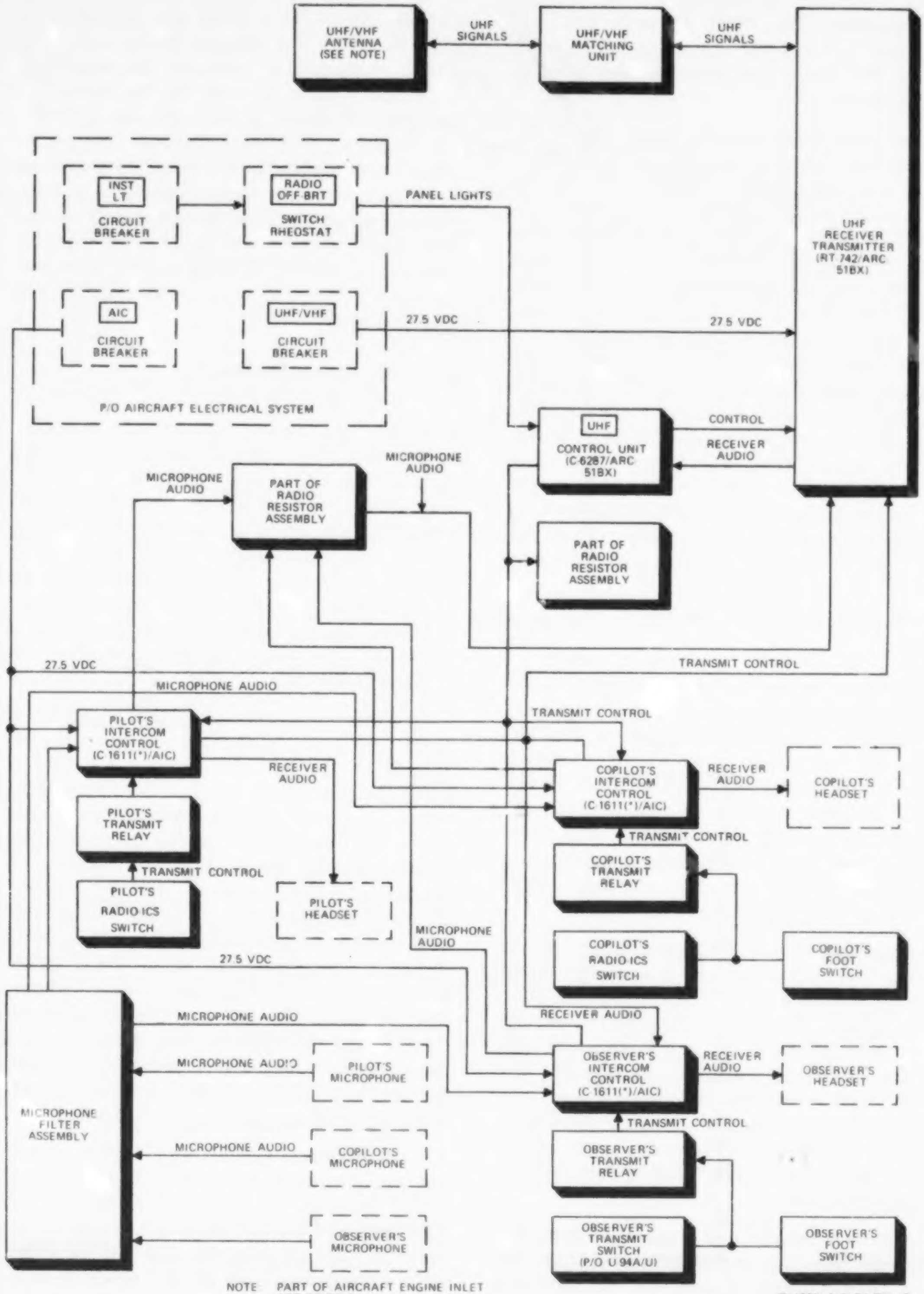
b. Operational Control and Audio Circuits. Except for the physical configuration of the vhf radio set (which employs separate vhf receiver-transmitter and amplifier power supply units) and the available frequency range, the vhf communication facility is essentially a counterpart of the uhf communication facility. Operational control and audio circuits are therefore similar to those in the uhf facility (para 3-6*b*). The vhf receiver-transmitter contains the operating controls. RF signals received by the receiver, from the uhf/vhf antenna through the uhf/vhf unit, are transformed to intermediate frequency (IF) signals and applied to the amplifier power supply. Resultant receiver audio signals are then furnished by the amplifier-power supply. Amplitude modulated signals are received when the transmit-interphone selector switch on the intercom control is set to position 3 or the RECEIVERS 3 switch is positioned to ON.

3-8. Direction Finder Facility
(figs. 1-8 and 3-5)

The direction finder facility uses the adf fixed loop antenna, an adf sense antenna, adf receiver, an adf mounting that contains a dc-to-ac inverter, an adf control unit, the bearing display portion of the homing, heading, and bearing indicator, and installation items common to the interphone facility. The direction finder facility automatically provides an indication of the relative bearing of a selected am. radio station in the 190-1750 kHz band. Manual operation may be selected if desired.

a. Power Control and Distribution. Power (27.5 vdc) is supplied from the aircraft electrical system to the adf facility through two circuit breakers (INST LT and ADF). The INST LT circuit breaker closes a panel lights circuit for application of 27.5 vdc to the RADIO OFF-BRT switch-rheostat which dims and controls the intensity of panel lamps in the adf control unit. The adf circuit breaker, when closed, provides 27.5 vdc to the adf control unit. The adf control unit controls application of dc power (27.5 vdc) to the adf receiver mounting from where it is distributed to the adf receiver and the dc-to-ac inverter on the adf receiver mounting. The dc-to-ac inverter converts dc power to ac power for use by the adf control unit, adf receiver and the homing, heading, and bearing indicator.

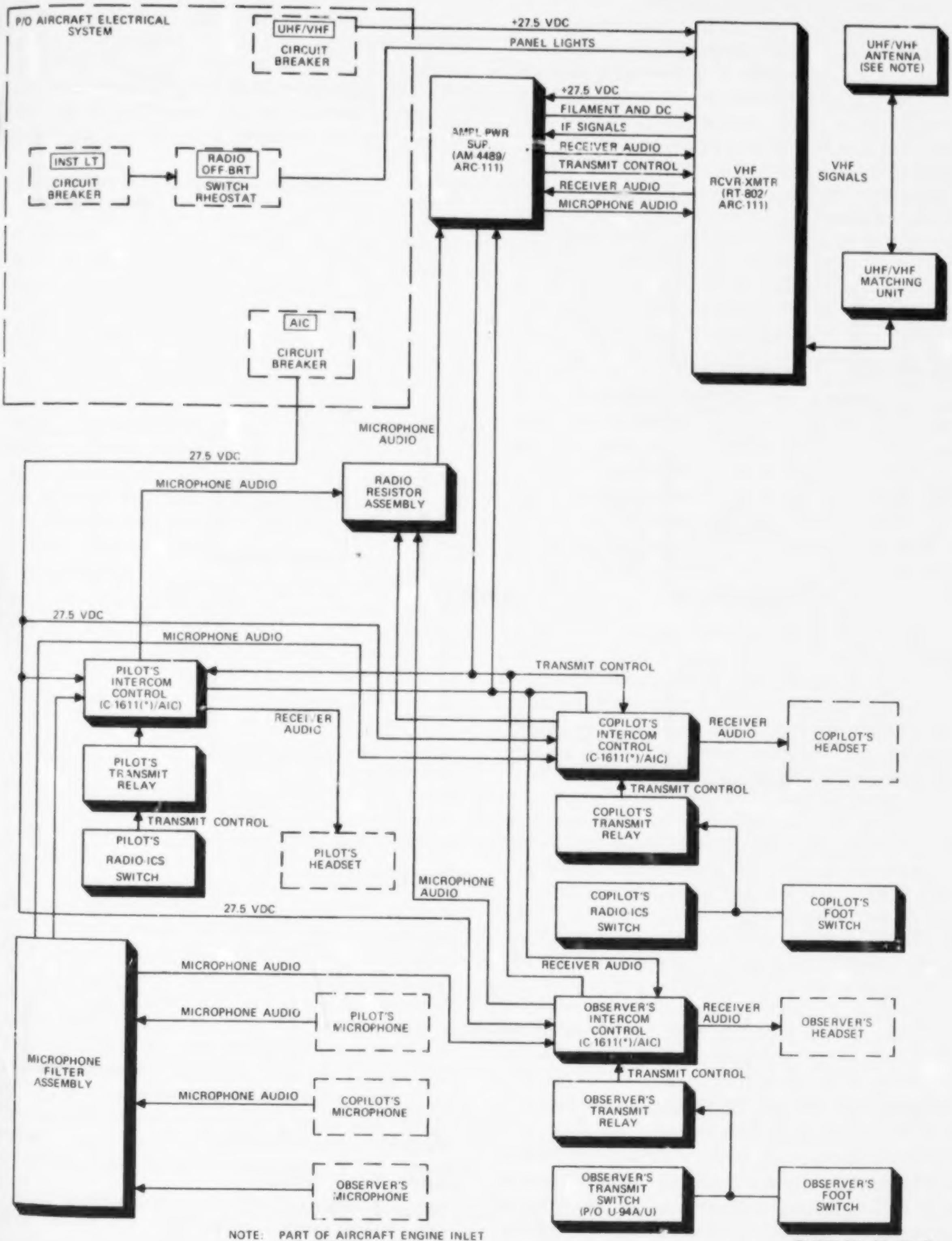
b. Operational Control and Audio Circuits. The adf sense antenna is an omnidirectional antenna which receives RF signals for the adf receiver. The fixed adf loop antenna is a highly directional radio signal antenna for the adf receiver. The adf receiver processes all RF received into bearing and receiver audio signals. Bearing signals from the adf receiver are routed through the


UHF/VHF ANTENNA (SEE NOTE)
UHF SIGNALS
UHF/VHF MATCHING UNIT
UHF SIGNALS
UHF RECEIVER TRANSMITTER (RT 742/ARC 51BX)
INST LT
CIRCUIT BREAKER
RADIO OFF-BRT
SWITCH RHEOSTAT
PANEL LIGHTS
AIC
CIRCUIT BREAKER
UHF/VHF
CIRCUIT BREAKER
27.5 VDC
27.5 VDC
P/O AIRCRAFT ELECTRICAL SYSTEM
UHF
CONTROL UNIT (C-6287/ARC 51BX)
CONTROL
RECEIVER AUDIO
MICROPHONE AUDIO
PART OF RADIO RESISTOR ASSEMBLY
MICROPHONE AUDIO
PART OF RADIO RESISTOR ASSEMBLY
27.5 VDC
TRANSMIT CONTROL
MICROPHONE AUDIO
TRANSMIT CONTROL
PILOT'S INTERCOM CONTROL (C 1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S INTERCOM CONTROL (C 1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S HEADSET
PILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
COPILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
PILOT'S RADIO-ICS SWITCH
PILOT'S HEADSET
MICROPHONE AUDIO
COPILOT'S RADIO-ICS SWITCH
COPILOT'S FOOT SWITCH
27.5 VDC
MICROPHONE AUDIO
RECEIVER AUDIO
OBSERVER'S INTERCOM CONTROL (C 1611(*)/AIC)
RECEIVER AUDIO
OBSERVER'S HEADSET
MICROPHONE AUDIO
PILOT'S MICROPHONE
MICROPHONE FILTER ASSEMBLY
TRANSMIT CONTROL
OBSERVER'S TRANSMIT RELAY
MICROPHONE AUDIO
COPILOT'S MICROPHONE
OBSERVER'S MICROPHONE
OBSERVER'S TRANSMIT SWITCH (P/O U-94A/U)
OBSERVER'S FOOT SWITCH

NOTE: PART OF AIRCRAFT ENGINE INLET AFT FAIRING.

EL1520-214-20-TM-16

Figure 3–3. Uhf communication facility, block diagram.


P/O AIRCRAFT ELECTRICAL SYSTEM
UHF/VHF
CIRCUIT BREAKER
INST LT
CIRCUIT BREAKER
RADIO OFF-BRT
SWITCH RHEOSTAT
AIC
CIRCUIT BREAKER
+27.5 VDC
PANEL LIGHTS
AMPL PWR SUP. (AM-4489/ARC-111)
+27.5 VDC
FILAMENT AND DC
IF SIGNALS
RECEIVER AUDIO
TRANSMIT CONTROL
RECEIVER AUDIO
MICROPHONE AUDIO
VHF RCVR-XMTR (RT-802/ARC-111)
VHF SIGNALS
UHF/VHF ANTENNA (SEE NOTE)
UHF/VHF MATCHING UNIT
MICROPHONE AUDIO
27.5 VDC
MICROPHONE AUDIO
RADIO RESISTOR ASSEMBLY
27.5 VDC
MICROPHONE AUDIO
TRANSMIT CONTROL
PILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
COPILOT'S HEADSET
PILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
COPILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
PILOT'S RADIO-ICS SWITCH
PILOT'S HEADSET
MICROPHONE AUDIO
COPILOT'S RADIO-ICS SWITCH
COPILOT'S FOOT SWITCH
27.5 VDC
MICROPHONE AUDIO
RECEIVER AUDIO
OBSERVER'S INTERCOM CONTROL (C-1611(*)/AIC)
RECEIVER AUDIO
OBSERVER'S HEADSET
MICROPHONE AUDIO
PILOT'S MICROPHONE
MICROPHONE FILTER ASSEMBLY
TRANSMIT CONTROL
OBSERVER'S TRANSMIT RELAY
MICROPHONE AUDIO
COPILOT'S MICROPHONE
OBSERVER'S MICROPHONE
OBSERVER'S TRANSMIT SWITCH (P/O U-94A/U)
OBSERVER'S FOOT SWITCH

NOTE: PART OF AIRCRAFT ENGINE INLET AFT FAIRING.

EL1520-214-20-TM-17

Figure 3-4. Vhf communication facility, block diagram.

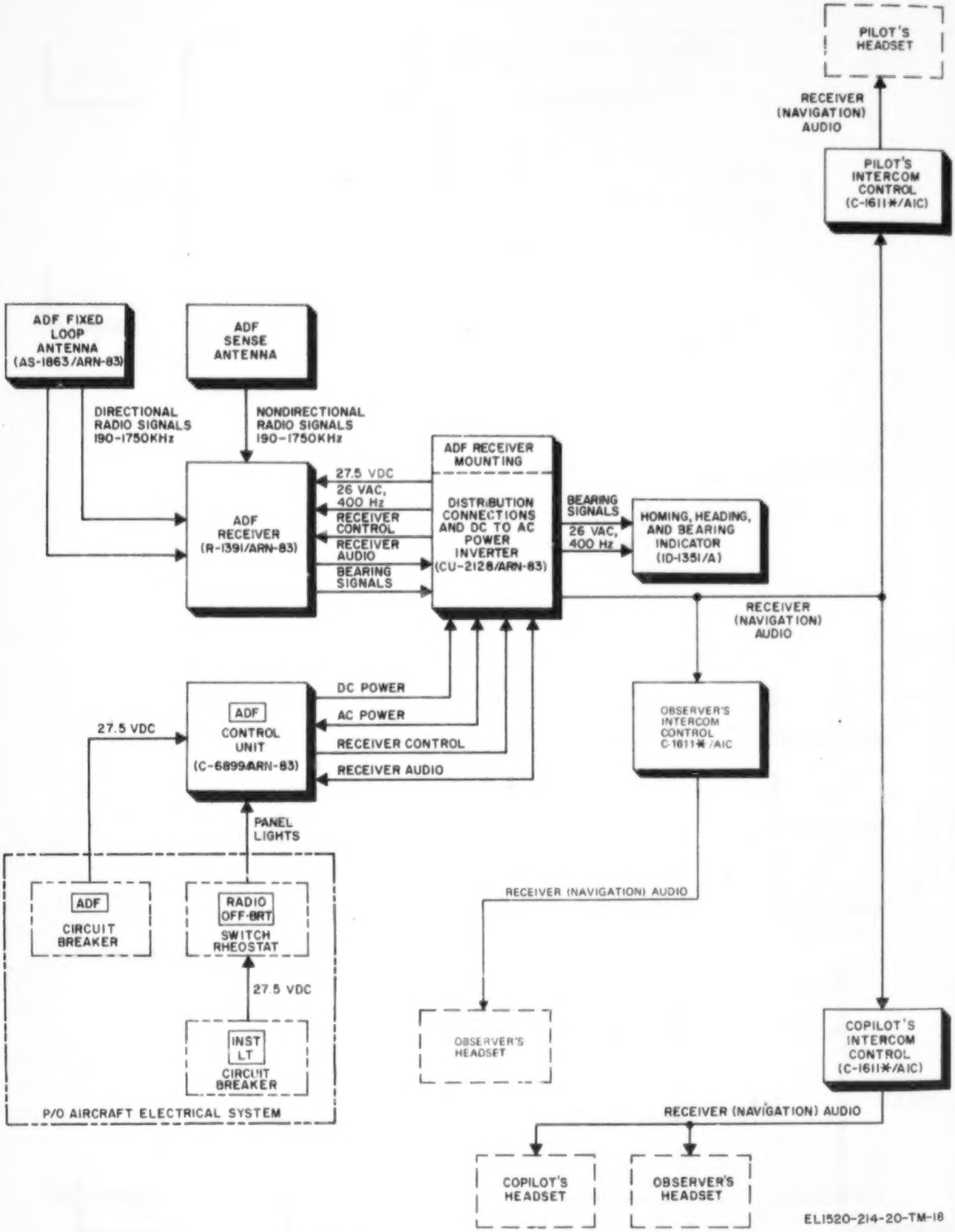

PILOT'S HEADSET
RECEIVER (NAVIGATION) AUDIO
PILOT'S INTERCOM CONTROL (C-1611*/AIC)
ADF FIXED LOOP ANTENNA (AS-1863/ARN-83)
ADF SENSE ANTENNA
DIRECTIONAL RADIO SIGNALS 190-1750KHz
NONDIRECTIONAL RADIO SIGNALS 190-1750KHz
ADF RECEIVER MOUNTING
27.5 VDC
26 VAC, 400 Hz
RECEIVER CONTROL
RECEIVER AUDIO
BEARING SIGNALS
ADF RECEIVER (R-1391/ARN-83)
DISTRIBUTION CONNECTIONS AND DC TO AC POWER INVERTER (CU-2128/ARN-83)
BEARING SIGNALS
26 VAC, 400 Hz
HOMING, HEADING, AND BEARING INDICATOR (ID-1351/A)
RECEIVER (NAVIGATION) AUDIO
DC POWER
AC POWER
RECEIVER CONTROL
RECEIVER AUDIO
27.5 VDC
ADF
CONTROL UNIT (C-6899/ARN-83)
OBSERVER'S INTERCOM CONTROL C-1611*/AIC
PANEL LIGHTS
ADF
CIRCUIT BREAKER
RADIO OFF-BRT
SWITCH RHEOSTAT
27.5 VDC
INST LT
CIRCUIT BREAKER
P/O AIRCRAFT ELECTRICAL SYSTEM
RECEIVER (NAVIGATION) AUDIO
OBSERVER'S HEADSET
COPILOT'S INTERCOM CONTROL (C-1611*/AIC)
RECEIVER (NAVIGATION) AUDIO
COPILOT'S HEADSET
OBSERVER'S HEADSET
EL1520-214-20-TM-18

Figure 3-5. Direction finder facility, block diagram.

adf receiver mounting for a visual indication of the relative bearing of the radio station on the homing, heading, and bearing indicator by the radio pointer (fig. 1-8). The adt control unit (fig. 3-5) controls direction finder facility operation and the level of receiver audio signals routed through the intercom controls to the pilot's, copilot's, and observer's headsets in the facility.

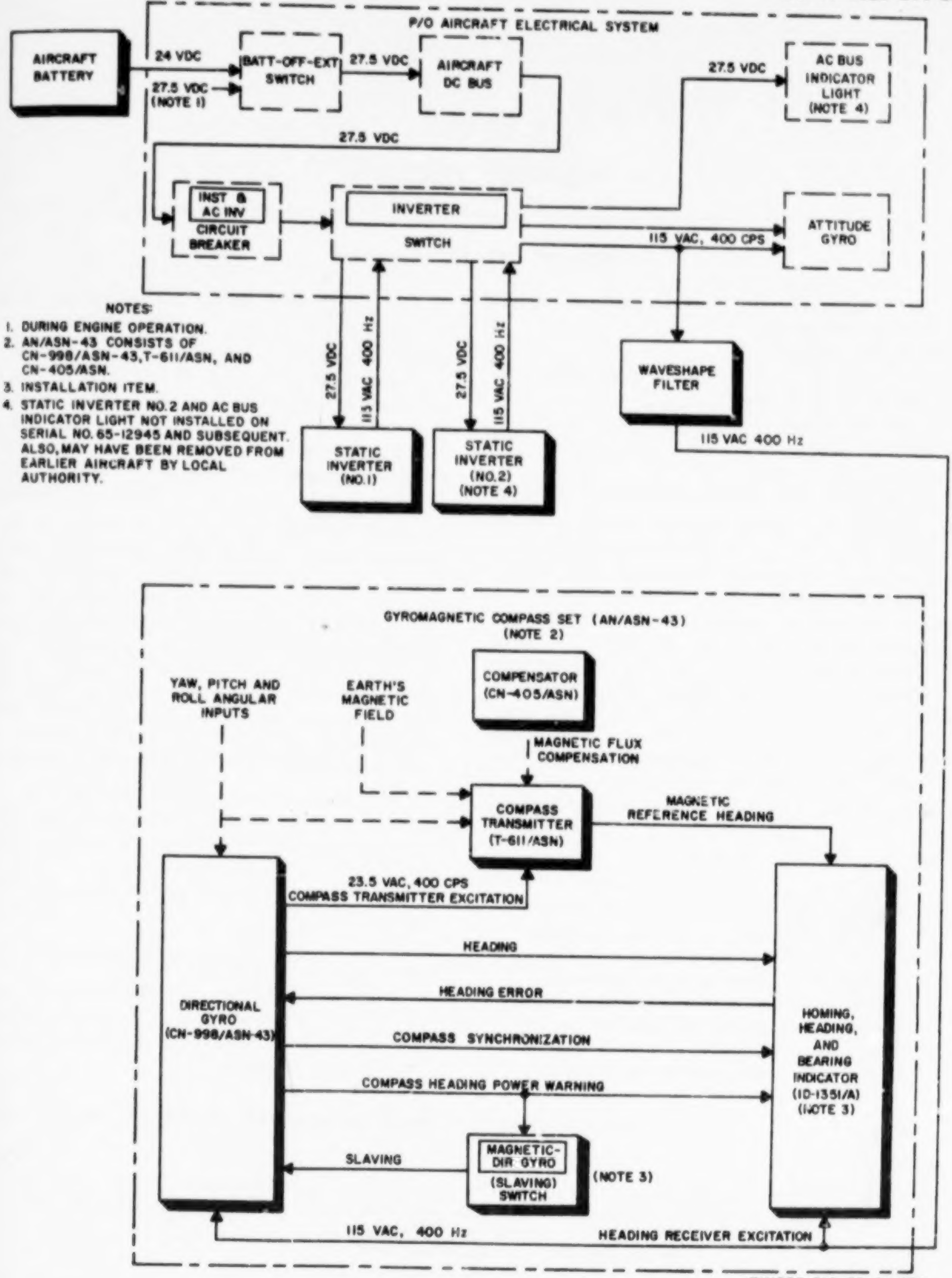
3-9. Heading Reference Facility

(figs. 1-8 and 3-6)

The heading reference facility (fig. 3-6) consists of a gyromagnetic compass set (TM 11-6605-202-12), the heading display portion of the homing, heading, and bearing indicator, a MAGNETIC-DIR GYRO (slaving) switch, a static inverter (two inverters in some configurations), and a waveshape filter. A directional gyro, compass transmitter, and compensator form the gyromagnetic compass set. The heading reference facility provides navigational information by visually displaying the heading of the aircraft on the homing, heading, and bearing indicator, and furnishes power for the attitude gyro of the aircraft electrical system.

a. Power Control and Distribution. Power (27.5 vdc) is supplied to the static inverter (or to inverter No. 1 in double-inverter configurations) from the aircraft electrical system through the BATT-OFF-EXT switch, aircraft dc bus, INST and AC INV circuit breaker, and INVERTER switch. The static inverter converts the 27.5 vdc to a 115 vac, 400 Hz, 10 square wave output which is filtered and shaped by a waveshape filter. The ac power is used by the directional gyro and the homing, heading, and bearing indicator. The directional gyro provides 23.5 vac, 400 Hz for compass transmitter excitation. The 115 vac, 400 Hz output of the static inverter is also used without filtering to power the attitude gyro in the aircraft electrical system. In case of failure of static inverter No. 1 (in double-inverter configurations only), the INVERTER switch may be set to the 2 position to remove dc power from inverter No. 1 and apply it to inverter No. 2. The secondary inverter supplies 115 vac power only to the attitude gyro. In such a case, the AC BUS indicator light illuminates indicating the secondary static inverter is on and no ac power is available to the gyromagnetic compass set which is deactivated.

b. Operational Control. The gyromagnetic compass set of the heading reference facility provides accurate heading information, referenced to a free directional gyro heading when operated in the DG mode (free mode), or slaved to the earth's magnetic field when operated in the MAG mode (magnetically slaved). The stabilized heading information is provided in the form of a synchro output to the homing, heading, and bearing indicator. Deviations from a magnetic or selected reference heading (MAG and DG modes, respectively), in the form of yaw angular inputs, are sensed by the directional gyro to furnish a stabilized heading signal to the homing, heading, and bearing indicator. For MAG mode operation the MAGNETIC-DIR GYRO (slaving) switch is set to the MAGNETIC position, a slaving control signal is applied to the directional gyro, and the output of the directional gyro is a stabilized heading signal slaved to a magnetic reference heading from the compass transmitter. The compass transmitter detects the earth's magnetic field; compensation of the compass transmitter for the influence of static magnetic fields normally found in the aircraft is accomplished by a magnetic flux compensator. A magnetic reference heading from the compass transmitter, determined by the earth's magnetic field and the aircraft yaw angular input, is also applied to the homing, heading, and bearing indicator. The homing, heading, and bearing indicator provides a synchro heading display, using the scale dial (fig. 1-8), and compares the heading and reference heading signals (fig. 3-6) to produce a heading error signal to continuously slave the directional gyro and maintain a correct heading signal. Both the direction gyro and compass transmitter can operate with varied pitch and roll inputs while providing correct heading and reference heading data. Compass synchronization signals from the directional gyro control the annunciator (fig. 1-3) on the homing, heading, and bearing indicator which displays a cross (+), a dot (.), or a null to indicate that the aircraft heading (right, left, or on course) in respect to the displayed heading. The + and . also indicate unsynchronized operation of the gyromagnetic compass set (directional gyro not slaved to earth's magnetic field). This condition may be corrected by rotating the synchronizing knob. When the slaving switch (fig. 3-6) is set to DIR GYRO for DG mode operation, the output of the directional gyro is a latitude-corrected free gyro reference (stabilized heading signal not slaved to earth's magnetic field). In the DG mode the directional gyro is set to a reference heading. The pilot selects the desired reference heading using the synchronizing knob (fig. 1-8) on the homing, heading, and bearing indicator. The directional gyro (fig. 3–6) retains the selected reference heading at all times while in the DG mode. While in this mode, the magnetic reference heading from the compass transmitter and the compass synchronization signal are not used and the annunciator is deenergized. A compass heading power warning signal keeps the power failure meter (compass warning flag) (fig. 1–8) from being displayed on the homing, heading, and bearing indicator. Loss of power to the gyromagnetic compass set (fig. 3–6) results in the visible display of the compass warning flag indicating an OFF condition. When flying in latitudes above 70° in the northern hemisphere, DG operation is recommended; the LATITUDE switch on the directional gyro should be at the N (North) position and the slaving switch should be set to DIR GYRO. When flying at latitudes below 70° in the northern hemisphere MAG operation is recommended; the LATITUDE switch should be at the N position and the slaving switch should be set to MAG. TM 11–6605–202–12 provides operating and organizational maintenance instructions for the gyromagnetic compass set.


P/O AIRCRAFT ELECTRICAL SYSTEM
AIRCRAFT BATTERY
24 VDC
27.5 VDC (NOTE 1)
BATT-OFF-EXT SWITCH
27.5 VDC
AIRCRAFT DC BUS
27.5 VDC
AC BUS INDICATOR LIGHT (NOTE 4)
27.5 VDC
INST & AC INV CIRCUIT BREAKER
INVERTER SWITCH
ATTITUDE GYRO
115 VAC, 400 CPS
27.5 VDC
115 VAC 400 Hz
27.5 VDC
115 VAC 400 Hz
WAVESHAPE FILTER
115 VAC 400 Hz
STATIC INVERTER (NO.1)
STATIC INVERTER (NO.2) (NOTE 4)
GYROMAGNETIC COMPASS SET (AN/ASN-43) (NOTE 2)
COMPENSATOR (CN-405/ASN)
YAW, PITCH AND ROLL ANGULAR INPUTS
EARTH'S MAGNETIC FIELD
MAGNETIC FLUX COMPENSATION
COMPASS TRANSMITTER (T-611/ASN)
MAGNETIC REFERENCE HEADING
23.5 VAC, 400 CPS COMPASS TRANSMITTER EXCITATION
HEADING
HEADING ERROR
COMPASS SYNCHRONIZATION
COMPASS HEADING POWER WARNING
DIRECTIONAL GYRO (CN-998/ASN-43)
HOMING, HEADING, AND BEARING INDICATOR (ID-1351/A) (NOTE 3)
SLAVING
MAGNETIC-DIR GYRO (SLAVING) SWITCH
(NOTE 3)
115 VAC, 400 Hz
HEADING RECEIVER EXCITATION

NOTES:

1. DURING ENGINE OPERATION.
2. AN/ASN-43 CONSISTS OF CN-998/ASN-43, T-611/ASN, AND CN-405/ASN.
3. INSTALLATION ITEM.
4. STATIC INVERTER NO. 2 AND AC BUS INDICATOR LIGHT NOT INSTALLED ON SERIAL NO. 65-12945 AND SUBSEQUENT. ALSO, MAY HAVE BEEN REMOVED FROM EARLIER AIRCRAFT BY LOCAL AUTHORITY.

TM1520-214-20-C1-857

Figure 3-6. Heading reference facility, block diagram.

CHAPTER 4

ANCILIARY EQUIPMENT

Section I. STATIC INVERTER

4-1. Description of Static Inverter
(A, fig. 2-10)

a. The static inverter is a solid-state device that converts 28-volt dc power to 115-volt ac, 400-Hz power under loads of 40 to 65 volt- amperes. The ac power provided by the inverter is used by the attitude gyro (in the aircraft electrical system) and by the heading reference facility (para 3-9).

b. Aircraft bearing serial numbers 65-12918 through 65-12944 were originally equipped with two inverters; a primary (No. 1) inverter, used during normal operation, and a No. 2 inverter, used only for emergency operation of the attitude gyro. Any failure of the No. 1 inverter automatically lights the AC BUS indicator. The INVERTER switch, in this event, transfers power from the No. 1 to No. 2 inverter and disconnects the heading reference facility from the ac output, supplying power to only the attitude gyro.

c. On aircraft bearing serial numbers 65-12945 and subsequent (and on some earlier models that have been field modified) the No. 2 (standby) inverter is not installed and the INVERTER switch is used only to turn the ac power system on or off.

4-2. Technical Characteristics

Input requirements	28 vdc.
Output voltage	105 to 125 vac.
Output frequency	400 Hz ±3%, 1Ø, (square wave).
Power output	40 volt-amperes, minimum; 65 volt-amperes, maximum.
Operating temperature range	−25°F to +130°F.
Altitude range	Sea level to 25,000 feet.
Weight	1.05 pound, maximum.

4-3. Maintenance Checks and Services

Preventive maintenance checks and services of the static inverter are to be performed concurrently with applicable preventive maintenance checks and services of the aircraft, unless otherwise specified by the commanding officer (para 2-5). To assist the organizational maintenance personnel in maintaining the static inverter in good serviceable condition, a chart of maintenance checks and services is presented in paragraph 4-4. The chart indicates what to check, how to check, and the normal conditions. The *References* column lists the paragraphs and illustrations that contain applicable additional information.

NOTE

> The static inverter is supplied with operating power from the INVERTER switch in the aircraft electrical system. Before taking remedial action in the case of apparent static inverter failure, check first to determine that the cause is not in the INVERTER switch. Refer failure of the switch to aircraft maintenance personnel for maintenance.

4-4. Periodic Preventive Maintenance Check and Services Chart

Sequence No.	Item	Procedure	References
1	Mounting	*a.* Check static inverter for loose mounting; check for loose screws. *b.* Check that supporting stiffeners are secured to airframe.	Para 4-5; fig. 2-10.
2	Electrical connection	Visually check connections to the three	Para 4-5; fig. 2-10.

Sequence No.	Item	Procedure	References
		terminals; ensure wires are secured to terminals and wires are not frayed, damaged, or touching the airframe.	
3	Overall condition	Check that static inverter is free of corrosion and terminals are clean.	Para 4-6.
4	Output voltage	Check that output voltage of static inverters is correct.	Para 4-7.

4-5. Removal and Replacement of Static Inverter

(fig. 2-10)

The following instructions pertain to both the single- and double-inverter configurations. Removal of the static inverter requires removal of the foot support fairing on the right-hand side of the canted bulkhead in the cargo compartment. Refer to paragraph 4-11 for waveshape filter instructions.

WARNING

The output of the static inverter is 115 vac, 400Hz. Contact with the output terminals may result in injury. Set the BATT-OFF-EXT switch to OFF, the INVERTER switch to OFF, and disconnect the battery, as well as auxiliary power.

a. Removal of Static Inverter. Remove the static inverter as follows:

(1) Remove the four screws (B, fig. 2-10) that secure the foot support fairing and slide out the fairing.

(2) Remove the four screws and washers (A, fig. 2-10) and washers that secure the static inverter as well as one side of the waveshape filter.

(3) Slide the inverter mounting flange from beneath the waveshape filter mounting plate and position it for access to the terminal connections.

(4) Disconnect the terminal lugs of the three wires (tagging each wire for later identification when the inverter is replaced).

b. Replacement of Static Inverter. Replace the static inverter as follows:

(1) Connect the terminal lugs of the three wires to the proper terminals; remove identifying tags from the wires.

(2) Place the static inverter in mounting position on the stiffeners with one side of the mounting flange inserted beneath the mounting plate of the waveshape filter.

(3) Secure the static inverter (and one side of the waveshape filter) to the anchor nuts in the stiffeners using four screws and washers.

(4) Replace the foot support fairing (B, fig. 2-10), securing it with four screws and washers.

4-6. Cleaning and Repainting of Static Inverter

Clean the static inverter as follows:

a. Remove the static inverter as instructed in paragraph 4-5*a*.

b. Check for corrosion on the terminals and the outside surfaces of the inverter. Remove all corrosion with No. 0000 sandpaper and repaint all bare spots in accordance with paragraph 2-8.

c. Replace the static inverter as outlined in paragraph 4-5*b*.

4-7. Output Voltage Check

WARNING

The output of the static inverter is 115 vac, 400 Hz. Contact with the output voltage may result in injury or death. Use extreme caution to avoid contact with the output terminal while performing the following procedures.

Removal of the foot support fairing (B, fig. 2-10) from the right side of the canted bulkhead in the cargo compartment is required for access to the static inverter (A, fig. 2-10) to perform output voltage checks. Perform an output voltage check on the static inverter as follows:

a. Remove the foot support fairing on the right-hand side of the canted bulkhead (para 4-5*a*).

b. Connect an auxiliary power source to the aircraft (para 2-4).

c. Set the multimeter for measurement of 115 ac.

d. Set the BATT–OFF–EXT switch (fig. 2–1) to EXT. The INST and AC INV circuit reaker must be in the ON position (depressed).

e. Set the INVERTER switch (fig. 2–1) to the n position (or to the 1 position for double-nverter configurations). Observe that the power-ailure flag in the homing, heading, and bearing ndicator disappears.

NOTE

> For double-inverter configurations, the power failure flag must disappear and the AC BUS indicator light must be out.

f. Connect the common lead of the multimeter to the aircraft frame (ground) and the ac lead to the output terminal on the inverter (inverter No. 1 in double-inverter configurations). The multimeter should indicate 105 to 125 volts ac.

g. For double-inverter configurations only, set the INVERTER switch (fig. 2–1) to the 2 position. The AC BUS indicator light must illuminate and the power-failure flag (fig. 1–8) must appear. The multimeter, connected to the output terminal of inverter No. 2 must indicate 105 to 125 volts ac.

h. Set the BATT–OFF–EXT and INVERTER switches (fig. 2–1) to OFF.

i. Replace the foot support fairing (B, fig. 2–10) and secure it to the canted bulkhead with the four screws and washers.

Section II. WAVESHAPE FILTER

NOTE

> The waveshape filter may be omitted as an item in some configurations. In those configurations, the waveshape filter is included as part of the static inverter.

–8. General
(fig. 2–10)

he waveshape filter (A, fig. 2–10) converts the quare wave output of the static inverter to a ine wave which is required by the heading refrence facility. The filter consists of a sealed, ectangular case attached to a mounting plate. n double-inverter configurations, the filter is intalled between the two inverters, with the mountng plate overlapping the inverter flanges so that he same screws can be used to secure both omponents. On single-inverter configurations, the ame arrangement is used, but a pair of washers s substituted for the missing inverter flange to aintain the proper spacing.

–9. Maintenance Checks and Services

reventive maintenance checks and services for he waveshape filter are performed concurrently with applicable preventive maintenance checks and services of the aircraft, unless otherwise specified by the commanding officer (para 2–5). To assist organizational maintenance personnel maintain the waveshape filter in good serviceable condition, a chart of maintenance checks and services is presented in paragraph 4–10. The chart indicates what to check, how to check, and the normal conditions. The *References* column lists the paragraphs and illustrations that contain applicable additional information.

NOTE

> The waveshape filter receives its power from the static inverter (inverter No. 1 on double-inverter configurations). Before taking remedial action in the case of apparent waveshape filter failure, check first to determine that the cause is not in the static inverter or aircraft electrical components (para 4–3).

–10. Periodic Preventive Maintenance Check and Service Chart

equence No.	Item	Procedure	References
1	Mounting	*a.* Check waveshape filter for loose mounting; check for loose screws.	Para 4–11, fig. 2–10.
		b. Check that supporting stiffeners are secured to airframe.	Para 4–11, fig. 2–10.
2	Electrical connections	Visually check connections to the three ter-	Para 4–11, fig. 2–10.

Sequence No.	Item	Procedure	References
		minal studs; ensure wires are secured to terminals and wires are not frayed, damaged, or touching the airframe.	
3	Overall condition	Check that waveshape filter is free of corrosion and terminals are clean.	Para 4-12.
4	Output voltage	Check that output voltage of waveship filter is correct.	Para 4-13.

4-11. Removal and Replacement of Waveshape Filter

(figs. 2-1 and 2-10)

Removal of the foot support fairing (B, fig. 2-10) from the right side of the canted bulkhead in the cargo compartment is required for access to the waveshape filter (A, fig. 2-10).

WARNING

> The input and the output of the waveshape filter is 115 vac, 400 Hz. Contact with these terminals may result in injury or death. Insure that all protective steps in the following procedures are performed.

a. Removal of Waveshape Filter.

(1) Set the INVERTER and BATT-OFF-EXT switches (fig. 2-1) to OFF. Disengage (pull up) the INST & AC INV circuit breaker. Disconnect the aircraft battery (TM 55-1520-214-20) and any auxiliary power from the aircraft.

(2) Remove the foot support fairing on the right-hand side of the canted bulkhead in the cargo compartment (B, fig. 2-10).

(3) Remove the three nuts (A, fig. 2-10) and terminal lugs from the terminal studs of the waveshape filter; tag and identify the three wires as an aid for replacement.

(4) Remove the four screws and washers that secure the mounting plate, and remove the filter.

b. Replacement of Waveshape Filter.

(1) Connect the three wires to the appropriate terminal studs (arranging the terminal lugs so that the filter can be installed with the terminals downward) and secure with the three terminal nuts; remove the identifying tags from the wires.

(2) Place the filter in its mounting position with the terminal connections downward.

NOTE

> On double-inverter configurations, the filter mounting plate should overlap one mounting flange of each inverter. On single-inverter configurations, install two washers under the mounting plate in place of the No. 2 inverter flange.

(3) Install the mounting screws as shown in A, figure 2-10.

(4) Replace the foot support fairing (B, fig. 2-10).

(5) Reconnect the aircraft battery (TM 55-1520-214-20).

4-12. Cleaning and Repainting the Waveshape Filter

Clean and repaint the waveshape filter as outlined in paragraph 4-6 removing and replacing the filter as instructed in paragraph 4-11.

4-13. Waveshape Filter Output Voltage Check

(figs. 2-1 and 2-10)

Removal of the foot support fairing (B, fig. 2-10) from the right side of the canted bulkhead in the cargo compartment is required for access to the waveshape filter (A, fig. 2-10) to perform the output voltage check. Perform the output voltage check as follows:

WARNING

> The input and output of the waveshape filter is 115 vac, 400 Hz. Contact with the output voltage may result in severe injury or death. Use extreme caution to avoid contact with the terminal studs of the waveshape filter while performing the procedures.

a. Perform the procedures in paragraph 4-7*a* through *e*.

b. Connect the common lead of the multimeter to the aircraft frame (ground) and the ac lead to the UT terminal stud of the waveshape filter. The multimeter should indicate an ac voltage of 105-125 volts.

c. Set the BATT-OFF-EXT and INVERTER switches (fig. 2-1) to OFF.

d. Replace the foot support fairing (B, fig. 2-10) and secure it to the canted bulkhead with four screws and washers.

Section III. AIRCRAFT BATTERY

4-14. General

In-aircraft maintenance of Battery, Storage BB-641/A is performed at organizational maintenance after every 25 hours of flight time or every other week, which ever occurs first. In-aircraft maintenance consists of inspection, removal, and replacement. Servicing and repair of the BB-641/A is performed by electronics (battery) maintenance personnel at a higher category of maintenance and in accordance with TM 11-6140-203-15-2 and TM 55-1520-214-20.

4-15. Description

The BB-641/A is a rechargeable, 24-volt, vented, nickel-cadmium battery. Nineteen individually replaceable cells are housed in a fiberglass case. The battery is connected to the electrical system by a two-pin keyed male connector located at one end of the battery case. The BB-641/A is similar to the BB-678/A installed in the SLAE equipped OH-6A helicopters (TM 11-1520-214-20-1). The battery cells and cases are interchangeable except for the connectors. The BB-641/A connector is a screw-type connector; the BB-678/A connector is a quick-disconnect type. The connectors are removable from the cases and may be interchanged according to installation requirements. Refer to TM 11-6140-203-15-2 for technical characteristics.

4-16. Battery Handling and Service Precautions

WARNING

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide, a caustic chemical agent. Serious burns will result if the electrolyte contacts the skin. Use rubber gloves, rubber aprons, and protective goggles when handling electrolyte. If accidental contact with the electrolyte is made, use ONLY clean water and IMMEDIATELY flush the contaminated area. Continue flushing for 15 minutes. Seek medical attention immediately.

WARNING

Explosive gasses are released from the battery when charging (in or out of the aircraft). Be sure the battery compartment is well ventilated before removing the battery. Be sure all power is removed from the aircraft when removing the battery. Be careful not to generate sparks in the vicinity of the battery compartment or a charging battery . . . NO SMOKING . . .

a. Satisfactory operation of the battery depends largely upon proper operation of the aircraft voltage regulator. Battery problems may often be prevented or eliminated by maintaining the voltage regulator setting at the precise voltage specified (TM 55-1520-214-20).

b. Because of the prevalence of lead-acid batteries in the field Army, contamination of the nickel-cadmium battery and its repair facilities is possible. If the lead-acid battery electrolyte (sulphuric acid) has inadvertently contaminated the nickel-cadmium battery, the upper areas of the battery cells will appear greenish in color. Contaminated batteries must be replaced.

4-17. Removal and Replacement of Battery

Refer to TM 55-1520-214-20 for removal and replacement procedures.

CHAPTER 5

FINAL ILLUSTRATIONS

5-1. General

This chapter contains all foldout illustrations. Figure 5-1 is a block diagram of the electronic configurations. Figures 5-2 and 5-3 are wiring diagrams and provide complete wiring data for both electronic configurations. Refer to paragraphs 5-2 and 5-3 for cable and wire identification and coding information.

5-2. Cable and Wire Identification

The cables and wires are identified by the type numbers; for example RF130A20N. The first symbol RF identifies the circuit function in accordance with the chart in paragraph 5-3. The second symbol, 130 is the cable number; it will differentiate between cables in the particular circuit. The third symbol A identifies the cable segment; it will identify the cable run between terminals or connections. The next symbol 20 indicates the wire size. The last symbol N, commonly called the ground letter, identifies a wire that completes a circuit to ground.

5-3. Cable Identification Code

Code letters and/or numbers	*Function*
ARC-111	Vhf communication facility
RF	Fm communication facility
RN	Direction finder facility
RU	Uhf communication facility
RZ	Interphone facility
TN	Heading reference facility

5-4. Use of the Wiring Diagrams (figs. 5-2 and 5-3)

a. Multipart wiring diagrams are provided for use by the organizational repairman to troubleshoot the avionics wiring in the OH-6A (without SLAE) helicopter. The wiring diagrams have been organized for ease of checking continuity of each wire.

b. Figure 5-2 is divided into 38 stations or areas as shown in the following tables. The stations are numbered from left to right within three horizontal zones.

(1) The upper zone of figure 5-2 is comprised of stations 1 through 15 divided among the three sheets of figure 5-2.

(2) The center zone of figure 5-2 is comprised of stations 16 through 31 divided among the three parts of figure 5-2. Station numbers 23 and 24 are assigned to an area only to retain continuity of the numbering system.

(3) The lower zone of figure 5-2 includes station numbers 32 through 38 and only includes parts 1 and 2 of figure 5-2.

c. Figure 5-3 is divided into 42 stations or areas. These stations are numbered from left to right within three horizontal zones.

(1) The upper zone of figure 5-3 is comprised of stations 1 through 15 divided among the three parts of figure 5-3.

(2) The center zone of figure 5-3 is comprised of stations 16 through 31 divided among the three parts of figure 5-3.

(3) The lower zone of figure 5-3 is comprised of stations 32 through 42 divided among the three parts of figure 5-3.

d. To save space, some stations extend into lower zones. For clarity, more than one station number may be used in one particular area of a zone.

e. The destination of each wire is indicated at that point where the wire enters the vertical column or baseline. The destination of that wire is given in terms of the destination station number and the specific terminal, connector, or connector and contact designation. Refer to station 1 (top left corner of sheet 1) of figure 5-2 for the following example:

> Contact A of connector P517 of the fm antenna coupler (E505) is connected, through wire RF437A20 to contact AA of connector P516 located at station 2. Station 2 is located directly to the right of station 1 and contact AA of P516 is evident. Continuity between these

two terminations of the wire can be verified immediately.

f. Station location and identification information for figures 5-2 and 5-3 are provided in tables 5-1, 5-2, and 5-3. Circled numbers in tables 5-1 and 5-2 indicate the station's and their relative locations in figures 5-2 and 5-3 respectively.

Table 5-1. Station Locations, Figure 5-2.

SHEET 1	SHEET 2	SHEET 3
① ② ③ ④ ⑤ ⑥	⑦ ⑧ ⑨	⑪ ⑫ ⑬ ⑭ ⑮
	⑩	㉙
⑯ ⑰ ⑲	⑳ ㉑ ㉖	㉚
⑱	㉒ ㉕	
	23 24	㉛
	㉞	
㉜ ㉝	㉟ ㊱ ㊲ ㊳	

Table 5-2. Station Locations, Figure 5-3.

SHEET 1	SHEET 2	SHEET 3
① ② ③ ④ ⑤ ⑥	⑦ ⑧ ⑨	⑪ ⑫ ⑬ ⑭
	⑩	
	㉗	⑮
⑯ ⑱ ㉑	㉒ ㉓ ㉔	
⑰ ⑲ ⑳	㉕ ㉖	㉘ ㉙ ㉚
㉝	㊶	㉛
㉜ ㊱	㊲ ㊴	
㉞ ㉟	㊳ ㊵	㊷

Table 5-3. Station Identification, Figures 5-2 and 5-3

Figure/Station No. assignment Fig. 5-2	 Fig. 5-3	Station identification
1	1	FM ANTENNA E504, FM ANTENNA COUPLER E505, P517, P539.
2	2	FM CONTROL UNIT A505, P516.
3	18	UHF CONTROL UNIT A501, P508.
4	4	VHF RECEIVER TRANSMITTER P513, P527, P512, J511.
5	5	FM RECEIVER TRANSMITTER RE/TR502, P1004, P1003, P1002, P518.
6	6	HOMING, HEADING, BEARING INDICATOR M500, P519.
7	7	OBSERVER'S INTERPHONE A506, P525.
8	8	POWER SUPPLY VHF RT PS501, P526, P514, P515.
9	9	ADF SENSE ANTENNA E500, ADF RECEIVER RE500, P501, P503, P504, P529, P530.
10	10	UHF RECEIVER TRANSMITTER RE/TR501, P509, P510, P511, CP511.
11	11	OBSERVER'S XMIT SWITCH; PILOT'S, COPILOT'S, OBSERVER'S MIC & HEADSET, MIC & HEADSET FILTER ASSEMBLY TB503.
12	12	TERMINAL BLOCK ASSEMBLY TB500.
13	--	TERMINAL BLOCK ASSEMBLY TB501 AND GYRO SLAVE SWITCH S501.
14	13	RESISTOR ASSEMBLY EQ500.
15	--	PILOT'S INTPH & XMIT RELAYS K500 & K501.
--	14	PILOT'S INTPH RELAY K500.
--	15	PILOT'S XMIT RELAY K501.
16	16	ADF CONTROL UNIT A500, P500.
--	17	GYRO SLAVE SWITCH S501, P156.

Table 5-3. Station Identification, Figures 5-2 and 5-3—Continued

Figure/Station No. assignment		Station identification
Fig. 5-2	Fig. 5-3	
17	--	PILOT'S & COPILOT'S CYCLIC STICK INTPH/XMIT SWITCHES S111 & S112, IN-LINE CONNECTORS P110, P130, P150, P151.
18	19	DIRECTIONAL GYRO MP500, P520.
19	20	COPILOT'S INTERPHONE A504, P522.
--	21	IN-LINE CONNECTOR P528.
20	22	PILOT'S INTERPHONE A503, P521.
21	23	INVERTER PS500, P506.
22	24	TERMINAL BOARD TB505.
23, 24	*	(NOT USED IN FIG. 5-2)
--	25	PILOT'S CYCLIC STICK INTPH/XMIT SWITCH S111, P150.
25	26	WAVESHAPE FILTER FL100.
26	27	FM HOMING ANTENNA SYSTEM: HY500, P533 THRU P538, T500, T501, E503.
27	28	OBSERVER'S FOOT SWITCH S503, P502.
28	29	OBSERVER'S CONTROL/RESISTOR ASSEMBLY EQ501.
29	30	COPILOT'S INTPH RELAY K502.
30	31	COPILOT'S XMIT RELAY K503.
--	32	IN-LINE CONNECTOR P155.
31	42	OBSERVER'S XMIT RELAY K505.
--	33	IN-LINE CONNECTOR P157.
--	34	COPILOT'S CYCLIC STICK INTPH/XMIT SWITCH S112, P151.
32	35	COPILOT'S FOOTSWITCH S502.
33	36	COMPENSATOR/ADF LOOP ANTENNA E501, P505.
34	37	COMPENSATOR/COMPASS TR504.
35	38	UHF/VHF MATCH UNIT Z500, ANTENNA E502, P523.
--	39	IN-LINE CONNECTOR P157.
36	40	IN-LINE CONNECTOR P2.
--	41	IN-LINE CONNECTOR P541.
37	--	CIRCUIT BREAKER CB12.
38	--	CIRCUIT BREAKER CB15.

Charts Transposed to
End of Volume.

APPENDIX A
REFERENCES

Following is a list of references available to the organizational repairmen of the electronic equipment configuration in Army Model OH-6A Helicopter:

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
SB 11-543	Safety and Breakaway Wire for Electronic Equipment Installed in Aircraft.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-1520-214-ESC	Equipment Serviceability Criteria for Electronic Equipment Configurations in Army Model OH-6A Helicopters.
TM 11-5820-518-20	Organizational Maintenance Manual: Radio Set AN/ARC-51X and AN/ARC-51BX.
TM 11-5820-518-20P	Organizational Maintenance Repair Parts and Special Tools List: Radio Sets AN/ARC-51X (NSN 5821-00-082-3698) and AN/ARC-51BX (5821-00-082-3926).
TM 11-5821-244-12	Operator's and Organizational Maintenance Manual: Radio Set AN/ARC-54 (NSN 5821-00-082-3598).
TM 11-5821-244-20P	Organizational and Maintenance Repair Parts and Special Tool Lists: Radio Set AN/ARC-54 (FSN 5821-082-3598).
TM 11-5826-225-12	Operator and Organizational Maintenance Manual: Direction Finder Set AN/ARN-83 (NSN 5826-00-912-4415).
TM 11-5831-201-20	Organizational Maintenance Manual: Control, Intercommunications Set C-1611D/AIC and Discriminator, Discrete Signal MD-736/A.
TM 11-6140-203-14-1	Operator's, Organizational, DS and GS Maintenance Manual for Aircraft and Nonaircraft Nickel-Cadmium Batteries (General).
TM 11-6140-203-14-2	Operator's, Organizational, DS and GS Maintenance Manual for Aircraft Nickel-Cadmium Batteries.
TM 11-6605-202-12	Operator's and Organizational Maintenance Manual: Gyromagnetic Compass Set AN/ASN-43.
TM 11-6625-203-12	Operator's and Organizational Maintenance Manual; Multimeter AN/URM-105 and AN/URM-105C (Including Multimeter ME-77/U and ME-77C/U).
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 43-0139	Painting Instructions for Field Use.
TM 55-1500-204-25/1	General Aircraft Maintenance Manual. TM 55-1520-214-20
TM 55-1520-214-10	Operator's Manual: Helicopter, Observation OH-6A.
TM 55-1520-214-20	Organizational Maintenance Manual Electronics Equipment Configuration, Army Model OH-6A Helicopter.
TM 55-1520-214-20PMD	OH-6A Aircraft, Preventive Maintenance Daily Inspection Checklist.
TM55-1520-214-20PMP	OH-6A Aircraft, Preventive Maintenance Periodic Inspection Checklist.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

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APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Helicopter, model OH-6A. It authorizes levels of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Group numbers correspond to the reference designation prefix assigned in accordance with USAS Y32.16, *Electrical and Electronics Reference Designations.* They indicate the relation of listed items to the next higher assembly.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The numbers used represent the various maintenance categories as follows:

Number	*Maintenance category*
C	Operator/crew
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self-explanatory.

B-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The numbers in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used.

Section II. MAINTENANCE ALLOCATION CHART

Group number	Component assembly nomenclature	Maintenance functions											Tools and equipment	Remarks
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild		
1	ELECTRONIC EQUIPMENT CONFIGURATION FOR ARMY HELICOPTER OH-6A.	O	O	O						O			2, 5, 11, 12	Visual inspection, replace easily removable cables, and remove all black boxes unless otherwise specified.
			F							F			1, 2, 3, 4, 6, 7, 8, 9, 10	Harness connectors and contractor furnished equipment. *Note.* Installation test is limited to equipment operation; installation repair is limited to replacement of components, knobs, and fuses.
1A	RADIO SET AN/ARC-111 INSTALLATION	O	O	O					O	O			5, 11, 12	See note above.
			F							F			6, 7, 9, 10	Repair harness.
1A1	AMPLIFIER POWER SUPPLY AM-4489/ARC-111	O		O					O				5, 11, 12	
										#				See TM 11-5821-265-15
1A2	MOUNTING MT-3592/ARC	O		O					O				5, 11, 12	
										#				See TM 11-5821-265-15
1A3	RECEIVER-TRANSMITTER RT-802/ARC-111	O	O	O					O				5, 11, 12	
										#				See TM 11-5821-265-15
1B	RADIO SET AN/ARC-51BX INSTALLATION	O	O	O					O	O			5, 11, 12	See note above.
			F							F			6, 7, 9, 10	Repair harness.
1B1	RECEIVER-TRANSMITTER RT-742(*)/ARC-51BX.	O	O	O					O				5, 11, 12	
										#				See TM 11-5820-518-20
1B2	MOUNTING MT-2653/ARC	O		O					O				5, 11, 12	
										#				See TM 11-5820-518-20
1B3	CONTROL, RADIO SET C-6287/ARC-51BX	O	O	O	O				O	O			5, 11, 12	Channel preset adjust.
										#				See TM 11-5820-518-20
1B4	COOLER, AIR, ELECTRONIC HD-615/ARC-51BX	O	O	O					O				5, 11, 12	
										#				See TM 11-5820-518-20
1B5	INDICATOR, STANDING WAVE RATIO ID-1003/ARC.	O	O	O					O				5, 11, 12	
										#				See TM 11-5820-518-20
1C	RADIO SET AN/ARC-54 INSTALLATION	O	O	O					O	O			5, 11, 12	See note above.
			F							F			6, 7, 9, 10	Repair harness.
1C1	RECEIVER-TRANSMITTER, RADIO RT-348/ARC-54.	O	O	O					O				5, 11, 12	
										#				See TM 11-5821-244-12
1C2	MOUNTING MT-1535/ARC-54	O		O					O				5, 11, 12	
1C3	CONTROL, RADIO SET C-3835/ARC-54	O	O	O					O				5, 11, 12	
										#				See TM 11-5821-244-12
1C4	ANTENNA (STRUCTURAL)	O		O										
										#				See TM 55-1520-214-20
1C5	COUPLER, FM CU-1759/ARC-54	O		O					O				11	
			F							F			1, 6, 7, 9, 10	

SECTION II MAINTENANCE ALLOCATION CHART FOR

OH-6A HELICOPTER WITHOUT SLAE

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
00	ELECTRONIC EQUIPMENT CONDIGURATION OH-6A HELICOPTER WITHOUT STANDARD LIGHTWEIGHT AVIONICS EQUIPMENT	Inspect[1]		0.4				
		Test[2]		0.2				
		Service		0.2				
		Repair[3,4]		0.2				1,2,6
01	INSTRUMENT PANEL ASSEMBLY OH-6A INSTR PNL	Inspect[1]		0.4				
		Test[2]		0.2				
		Service		0.2				
		Repair[4,5]			0.5			1,3,5
0101	RELAY ASSEMBLY	Inspect[1]		0.4				
		Test[2]		0.2				
		Replace		0.5				
		Repair			1.0			4,5
0102	CAPACITOR-RESISTOR ASSEMBLY	Inspect[1]		0.4				
		Test[2]		0.2				
		Replace		0.5				
		Repair			1.0			4,5
02	RADIO SET, AN/ARC-111 SEE TM 11-5821-265-20	Inspect		0.2				
		Test[2]		0.1				
		Service		0.1				
		Replace		0.3				2,6
		Repair[5]		0.2				2,6
		Test			0.5			5
		Repair[4]			0.5			2,3,5
0201	AMPLIFIER, AM-4489/ARC-111 SEE TM 11-5821-265-20	Replace		0.3				2
020101	HARNESS ASSEMBLY (A2W1)	Inspect		0.2				
		Repair			0.5			2
		Test			0.2			2,3,5
020102	HARNESS ASSEMBLY (A2W2)	Inspect		0.2				
		Repair			0.5			2
		Test			0.2			2,3,5
0202	MOUNTING, MT-3592/ARC-111 SEE TM 11-5821-265-20	Inspect		0.1				
		Replace		0.5				2
0203	RECEIVER-TRANSMITTER, RT-802/ARC-111 SEE TM 11-5821-265-20	Inspect		0.1				
		Test[2]		0.1				
		Service		0.1				
		Replace		0.4				2
020301	HARNESS ASSEMBLY (A2W3)	Inspect		0.2				
		Repair			0.5			2
		Test			0.2			2,3,5
03	RADIO SET AN/ARC-51BX SEE TM 11-5820-518-20	Inspect		0.2				
		Test[2]		0.1				
		Service		0.1				
		Replace		0.3				
		Repair[5]		0.5				
		Test			0.5			
		Repair[4]			1.0			
0301	CONTROL, RADIO C-6287/ARC-51BX SEE TM 11-5820-518-20	Test[2]		0.1				
		Adjust[7]		0.1				2
		Replace		0.3				2
		Repair[5]		0.2				1,2,6

(1) Visual inspection.
(2) Operational.
(3) Replace defective cables.
(4) Harness, connectors.
(5) Knobs, lamps, fuses, lenses.
(6) Nonreparable.
(7) Channel preset.

SECTION II MAINTENANCE ALLOCATION CHART FOR

OH-6A HELICOPTER WITHOUT SLAE

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
030101	COOLER, HD-615/ARC-51BX SEE TM 11-5820-518-20	Inspect		0.2				
		Test^2		0.1				
		Service		0.1				
		Replace		0.5				1,2
0302	INDICATOR, ID-1003/ARC-51BX SEE TM 11-5820-518-20	Inspect		0.1				
		Test^2		0.1				
		Replace		0.2				1,2
0303	MOUNTING MT-2653/ARC-51 SEE TM 11-5820-518-20	Inspect		0.1				
		Service		0.1				
		Replace		0.5				2
030301	HARNESS ASSEMBLY (A3W1)	Inspect		0.2				
		Repair			0.5			2
		Test			0.2			2,3,5
030302	HARNESS ASSEMBLY (A3W2)	Inspect		0.2				
		Repair			0.5			2
		Test			0.2			2,3,5
0304	RECEIVER-TRANSMITTER RT-742/ARC-51BX	Test^2		0.1				
		Service		0.1				
		Replace		0.3				2,6
04	RADIO SET, AN/ARC-54 SEE TM 11-5821-244-12	Replace		0.3				2
0401	ANTENNA, HOMING, RADIO SET AN/ARC-54	Inspect		0.1				
		Replace^6		0.3				2,6
		Service		0.1				
040101	NETWORK, HYBRID CIRCUIT	Inspect			0.1			
		Test			0.2			5
		Replace			0.5			2,6
04010101	HARNESS ASSEMBLY, HYBRID (A4W1)	Inspect			0.1			
		Test			0.2			5
		Repair			0.5			2,6
04010102	HARNESS ASSEMBLY, HYBRID (A4W2)	Inspect			0.1			
		Test			0.2			5
		Repair			0.5			2,6
04010103	HARNESS ASSEMBLY, HYBRID (A4W3)	Inspect			0.1			
		Test			0.2			5
		Repair			0.5			2,6
040102	TRANSFORMER, HOMING	Test			0.2			5
		Replace			0.5			2,6
0402	ANTENNA, FM COMMUNICATIONS (STRUCTURAL) AN/ARC-54	Inspect		0.1				
		Service		0.1				
		Replace		0.3				2
0403	CONTROL, RADIO SET C-3835/ARC-54 SEE TM 11-5821-244-12	Replace		0.3				2

SECTION II MAINTENANCE ALLOCATION CHART FOR

OH-6A HELICOPTER WITHOUT SLAE

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
0404	MOUNTING MT-1535/ARC-54 SEE TM 11-5821-244-12	Inspect		0.1				
		Replace		0.5				1,2
0405	RECEIVER-TRANSMITTER, RT-348/ARC-54 SEE TM 11-5821-244-12	Replace		0.3				2
040501	HARNESS ASSEMBLY (A4W4)	Inspect		0.2				
		Test			0.5			2,3,5
		Repair			0.5			2
05	CONTROL, INTERCOMMUNICATIONS SET C-1611(*)/AIC SEE TM 11-5831-201-15	Test[2]		0.2				
		Replace		0.2				2
		Repair[5]		0.1				2,6
0501	HARNESS ASSEMBLY (A5W1)	Inspect		0.2				
		Test			0.5			2,3,5
		Repair			0.5			2
0502	FILTER ASSEMBLY, HEADSET-MIKE	Inspect			0.1			
		Test[2]		0.2				
		Replace			0.5			2
0503	HEADSET SWITCH, JACK OBSERVER ASSEMBLY	Inspect			0.1			
		Test[2]		0.2				
		Replace			0.5			2
06	DIRECTION FINDER SET AN/ARN-83 SEE TM 11-5826-225-12	Inspect		0.2				
		Test[2]		0.1				
		Service		0.1				
		Adjust		0.2				2
		Replace		0.5				2,6
		Repair[5]		0.1				2,6
		Repair[4]		0.1				2,5
0601	ANTENNA, ADF LOOP AS-1863/ARN-83	Inspect		0.1				
		Replace[6]		0.3				2,6
		Service		0.1				
0602	CABLE ASSEMBLY (A6W1)	Inspect		0.1				
		Test			0.2			5
		Repair			0.5			2,6
0603	ANTENNA, ADF SENSE ARN-83	Inspect		0.1				
		Replace[6]		0.3				2,6
		Service		0.1				
0604	HARNESS ASSEMBLY ARN-83 (A6A2)	Inspect			0.1			
		Test			0.1			6
		Repair			0.2			2,6
0605	CONTROL, DIRECTION FINDER C-6899/ARN SEE TM 11-5826-225-12	Replace		0.2				2,6
0606	MOUNT ASSEMBLY ARN-83	Inspect		0.1				
		Replace		0.5				1,2
060601	MOUNT ASSEMBLY, RIGID 39 OR -6A WITH INVERTER CU-2130/ARN-83, P/N 369A4422-3 SEE TM 11-5826-225-12	Inspect		0.1				
		Replace		0.5				1,2
0607	RECEIVER, RADIO RT-1391/ARN-83 SEE TM 11-5826-225-12	Replace		0.2				2,6

SECTION II MAINTENANCE ALLOCATION CHART
FOR
OH-6A HELICOPTER WITH SLAE

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
060701	HARNESS ASSEMBLY ARN-83 (A6A4)	Inspect Test Repair			0.1 0.1 0.5			 5 1,2
060702	HARNESS ASSEMBLY ARN-83 (A6A5)	Inspect Test Repair			0.1 0.1 0.5			 5 1,2
07	GYROMAGNETIC COMPASS SET, AN/ASN-43 SEE TM 11-5605-202-12	Inspect Test[2] Service Replace Adjust		0.2 0.1 0.1 0.3	 0.5			 1,2,6 4,5
0701	GYRO, DIRECTIONAL CN-998/ASN/43 SEE TM 11-6605-202-12	Replace		0.3				1,2,6
0702	COMPENSATER, MAGNETIC FLUX, CN-405/ASN SEE TM 11-6605-202-12	Install Replace Adjust		0.2 0.4 0.1				2 2 5
0703	TRANSMITTER, INDUCTION COMPASS T-611/ASN SEE TM 11-6605-202-12	Service Replace Adjust		0.1 0.3	 0.3			 2 2,5
0704	HARNESS ASSEMBLY (A7A1)	Inspect Test Repair			0.1 0.2 0.5			 5 1,2
0705	STATIC INVERTER CV-2413/ASN	Test Replace			0.5 0.2			5 1,2
0706	INDICATOR ID-1351/A SEE SB11-497	Replace Repair		0.3			 3.0	2
08	BATTERY B-641/1 SEE TM 55-1520-214-20	Replace		0.5				2

TABLE I. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR

OH-6A HELICOPTER WITHOUT SLAE

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,F	MAINTENANCE KIT, ELECTRONIC EQUIPMENT MK-693/A	5821-00-045-9695	
2	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
3	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
4	F	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
5	F	MULTIMETER AN/USM-223	6625-00-999-7465	
6	O	MULTIMETER AN/URM-105C	6625-00-999-6282	
7	F	FREQUENCY METER AN/USM-207	6625-00-911-6268	
8	F	TEST SET, RF POWER AN/URM-120	6625-00-813-8430	

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Voltage Check:		
Static Inverter	4-7	4-2
Waveshape Filter	4-13	4-4
Waveshape Filter:		
Cleaning	4-12	4-4
General	4-8	4-3
Maintenance	4-9	4-3
Removal and Replacement	4-11	4-4
Wire and Cable Identification	5-2	5-1
Wire Diagrams, Use	5-4	5-1

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

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NOTES:

1. AN/ARC-51BX USED IN NORMAL INSTALLATION; AN/ARC-111 USED IN ALTERNATE INSTALLATION.
2. ANCILLARY EQUIPMENT.
3. STATIC INVERTER NO. 2 AND ASSOCIATED ITEMS NOT INSTALLED ON SERIAL NO. 65-12945 AND SUBSEQUENT. ALSO MAY HAVE BEEN REMOVED BY LOCAL AUTHORITY.

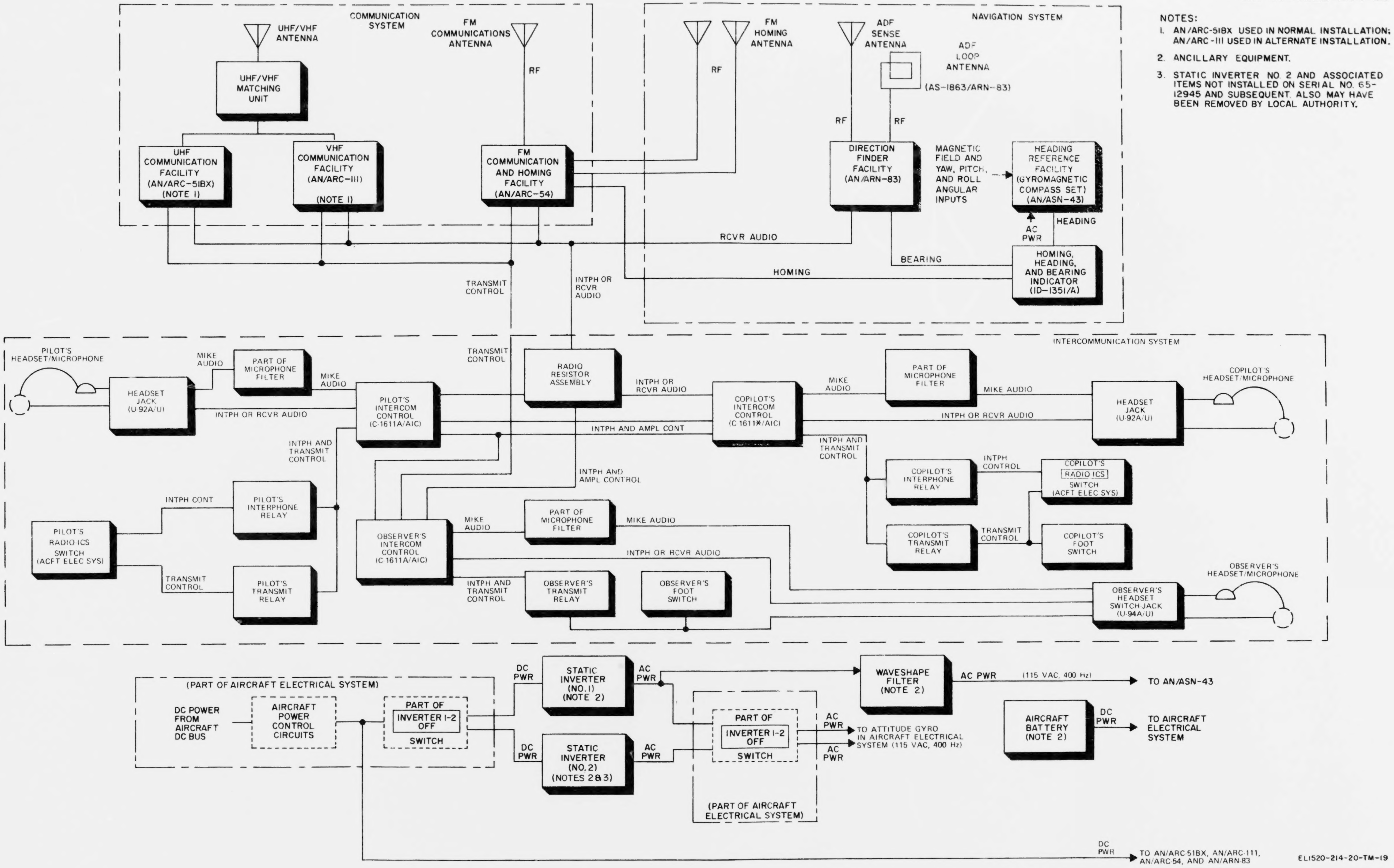
COMMUNICATION SYSTEM
UHF/VHF ANTENNA
UHF/VHF MATCHING UNIT
UHF COMMUNICATION FACILITY (AN/ARC-51BX) (NOTE 1)
VHF COMMUNICATION FACILITY (AN/ARC-111) (NOTE 1)
FM COMMUNICATIONS ANTENNA
RF
FM COMMUNICATION AND HOMING FACILITY (AN/ARC-54)
NAVIGATION SYSTEM
FM HOMING ANTENNA
RF
ADF SENSE ANTENNA
ADF LOOP ANTENNA
(AS-1863/ARN-83)
RF
RF
DIRECTION FINDER FACILITY (AN/ARN-83)
MAGNETIC FIELD AND YAW, PITCH, AND ROLL ANGULAR INPUTS
HEADING REFERENCE FACILITY (GYROMAGNETIC COMPASS SET) (AN/ASN-43)
AC PWR
HEADING
RCVR AUDIO
BEARING
HOMING
HOMING, HEADING, AND BEARING INDICATOR (ID-1351/A)
TRANSMIT CONTROL
INTPH OR RCVR AUDIO
INTERCOMMUNICATION SYSTEM
PILOT'S HEADSET/MICROPHONE
HEADSET JACK (U-92A/U)
MIKE AUDIO
PART OF MICROPHONE FILTER
MIKE AUDIO
INTPH OR RCVR AUDIO
TRANSMIT CONTROL
RADIO RESISTOR ASSEMBLY
PILOT'S INTERCOM CONTROL (C-1611A/AIC)
INTPH OR RCVR AUDIO
INTPH AND AMPL CONT
INTPH AND TRANSMIT CONTROL
INTPH AND AMPL CONTROL
COPILOT'S INTERCOM CONTROL (C-1611*/AIC)
MIKE AUDIO
PART OF MICROPHONE FILTER
MIKE AUDIO
INTPH OR RCVR AUDIO
HEADSET JACK (U-92A/U)
COPILOT'S HEADSET/MICROPHONE
INTPH AND TRANSMIT CONTROL
COPILOT'S INTERPHONE RELAY
INTPH CONTROL
COPILOT'S RADIO ICS SWITCH (ACFT ELEC SYS)
COPILOT'S TRANSMIT RELAY
TRANSMIT CONTROL
COPILOT'S FOOT SWITCH
INTPH CONT
PILOT'S INTERPHONE RELAY
PILOT'S RADIO-ICS SWITCH (ACFT ELEC SYS)
TRANSMIT CONTROL
PILOT'S TRANSMIT RELAY
OBSERVER'S INTERCOM CONTROL (C-1611A/AIC)
MIKE AUDIO
PART OF MICROPHONE FILTER
MIKE AUDIO
INTPH OR RCVR AUDIO
INTPH AND TRANSMIT CONTROL
OBSERVER'S TRANSMIT RELAY
OBSERVER'S FOOT SWITCH
OBSERVER'S HEADSET/MICROPHONE
OBSERVER'S HEADSET SWITCH-JACK (U-94A/U)
(PART OF AIRCRAFT ELECTRICAL SYSTEM)
DC POWER FROM AIRCRAFT DC BUS
AIRCRAFT POWER CONTROL CIRCUITS
PART OF INVERTER 1-2 OFF SWITCH
DC PWR
STATIC INVERTER (NO. 1) (NOTE 2)
AC PWR
DC PWR
STATIC INVERTER (NO. 2) (NOTES 2 & 3)
AC PWR
PART OF INVERTER 1-2 OFF SWITCH
(PART OF AIRCRAFT ELECTRICAL SYSTEM)
AC PWR
AC PWR
TO ATTITUDE GYRO IN AIRCRAFT ELECTRICAL SYSTEM (115 VAC, 400 Hz)
WAVESHAPE FILTER (NOTE 2)
AC PWR
(115 VAC, 400 Hz)
TO AN/ASN-43
AIRCRAFT BATTERY (NOTE 2)
DC PWR
TO AIRCRAFT ELECTRICAL SYSTEM
DC PWR
TO AN/ARC-51BX, AN/ARC-111, AN/ARC-54, AND AN/ARN-83
EL1520-214-20-TM-19

Figure 5–1. Configuration block diagram.

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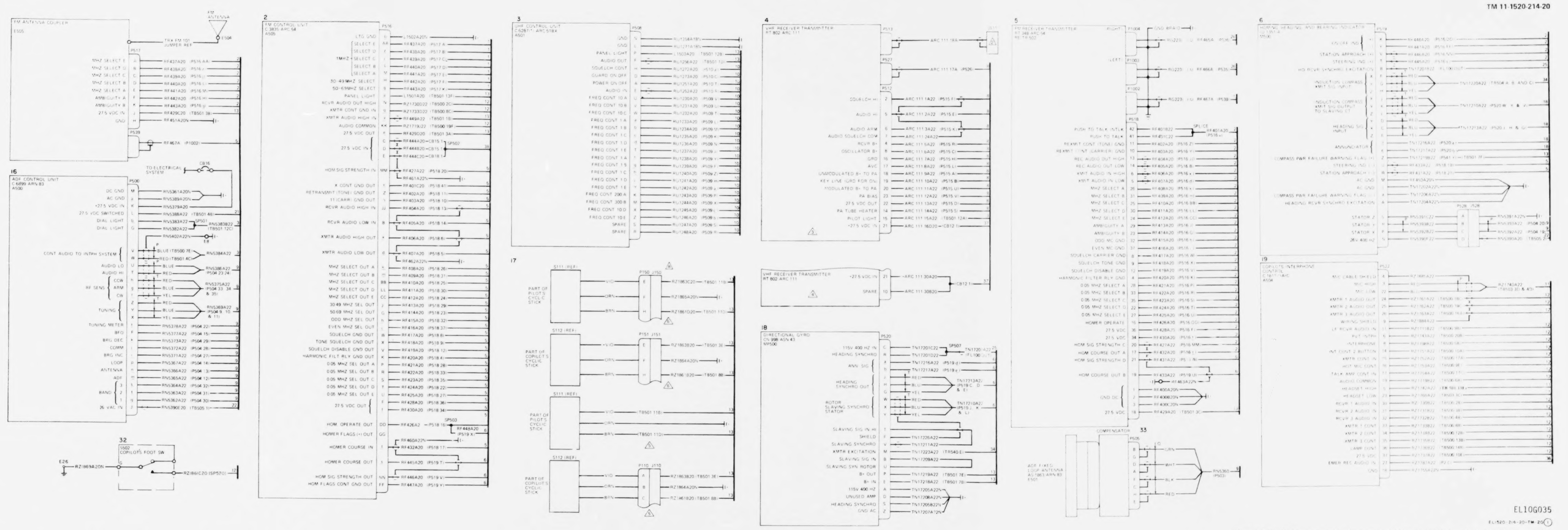
NOTES

1. EXAMPLE OF TERMINAL BLOCK BUSSING ARRANGEMENTS

A B C D E F | A B C | D E F | A B | C D | E F | A | B | C | D

2. ALTERNATE CONNECTION FOR P511, WHEN ARC 51BX IS NOT USED IS ARC-111 RCVR-XMTR, J511
3. USED ON SHIPS 65-12918 THROUGH 66-14376
4. USED ON SHIPS 66-14377 THROUGH 67-16126
5. USED ON SHIPS 65-12918 THROUGH 66-17795
6. USED ON SHIPS 66-17796 THROUGH 67-16126
7. USED ON SHIPS 67-16127 AND SUBSEQUENT
8. MAY BE J130/P130 ON SOME AIRCRAFT
9. P DESIGNATES TWISTED PAIR
   T DESIGNATES THREE TWISTED WIRES
   Q DESIGNATES FOUR TWISTED WIRES
10. STATIONS 23 AND 24 ARE SHOWN ONLY FOR CONTINUITY AND ARE NOT USED



FM ANTENNA COUPLER
E505
FM ANTENNA
E504
2
FM CONTROL UNIT
C 3835 ARC 54
A505
3
UHF CONTROL UNIT
C 6287(*) ARC 51BX
A501
4
VHF RECEIVER TRANSMITTER
RT 802 ARC 111
5
FM RECEIVER TRANSMITTER
RT 348 ARC 54
RE TR 502
6
HOMING HEADING AND BEARING INDICATOR
M500
16
ADF CONTROL UNIT
C 6899 ARN 83
A500
17
18
DIRECTIONAL GYRO
19
32
33
COMPENSATOR

EL10G035

EL1520-214-20-TM-20 ①

Figure 5-2 (1). Configuration Wiring Diagram (Serial Nos. 65-12918 through 67-16126) (Sheet 1 of 3).

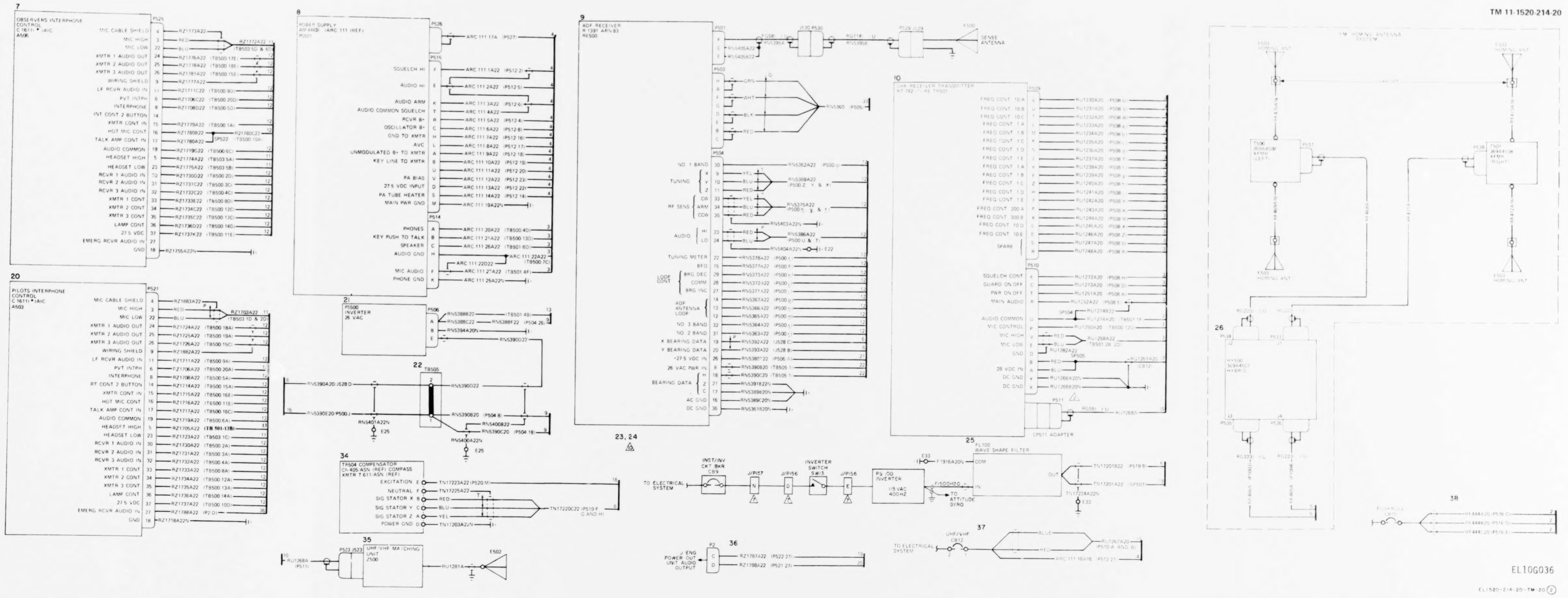

7
OBSERVERS INTERPHONE CONTROL C 1611(*)AIC A506
8
POWER SUPPLY AM 4480( )ARC 111 (REF) PS501
9
ADF RECEIVER R 1391 ARN 83 RE500
SENSE ANTENNA
10
UHF RECEIVER TRANSMITTER RT 742 ( ) RE TR501
FM HOMING ANTENNA SYSTEM
E503 HOMING ANT
T500 369A4508 XFMR (LEFT)
T501 369A4508 XFMR (RIGHT)
26
HY500 369A4507 HYBRID
20
PILOTS INTERPHONE CONTROL C 1611(*)AIC A503
21
PS500 INVERTER 26 VAC
22
TB505
23, 24
34
TR504 COMPENSATOR CN 405/ASN (REF) COMPASS XMTR T 611/ASN (REF)
35
UHF/VHF MATCHING UNIT Z500
E502
TO ELECTRICAL SYSTEM
INST/INV CKT BKR CB9
INVERTER SWITCH SW13
PS 100 INVERTER 115 VAC 400 HZ
TO ATTITUDE GYRO
25
FL100 WAVE SHAPE FILTER
CP511 ADAPTER
36
J ENG POWER OUT UNIT AUDIO OUTPUT
37
UHF/VHF CB12
38
PUSH PULL CB75
EL10G036
EL1520-214-20-TM-20 ②

Figure 5-2 (2). Configuration Wiring Diagram (Serial Nos. 65-12918 through 67-16126) (Sheet 2 of 3).

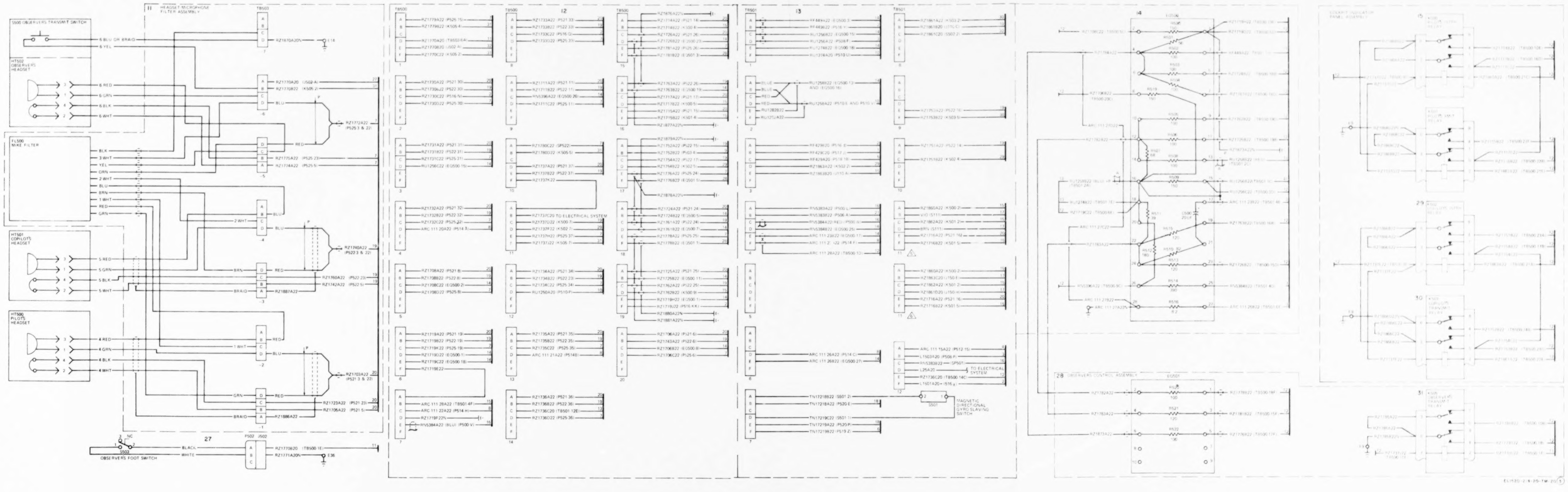

OBSERVERS TRANSMIT SWITCH
HT502 OBSERVERS HEADSET
FL500 MIKE FILTER
HT501 COPILOTS HEADSET
HT500 PILOTS HEADSET
HEADSET MICROPHONE FILTER ASSEMBLY
OBSERVERS FOOT SWITCH
TO ELECTRICAL SYSTEM
MAGNETIC DIRECTIONAL GYRO SLAVING SWITCH
OBSERVERS CONTROL ASSEMBLY
11
12
13
14
27
28
31

Figure 5-2③. Configuration wiring diagram (serial Nos. 65-12918 through 67-18126) (sheet 3 of 3).

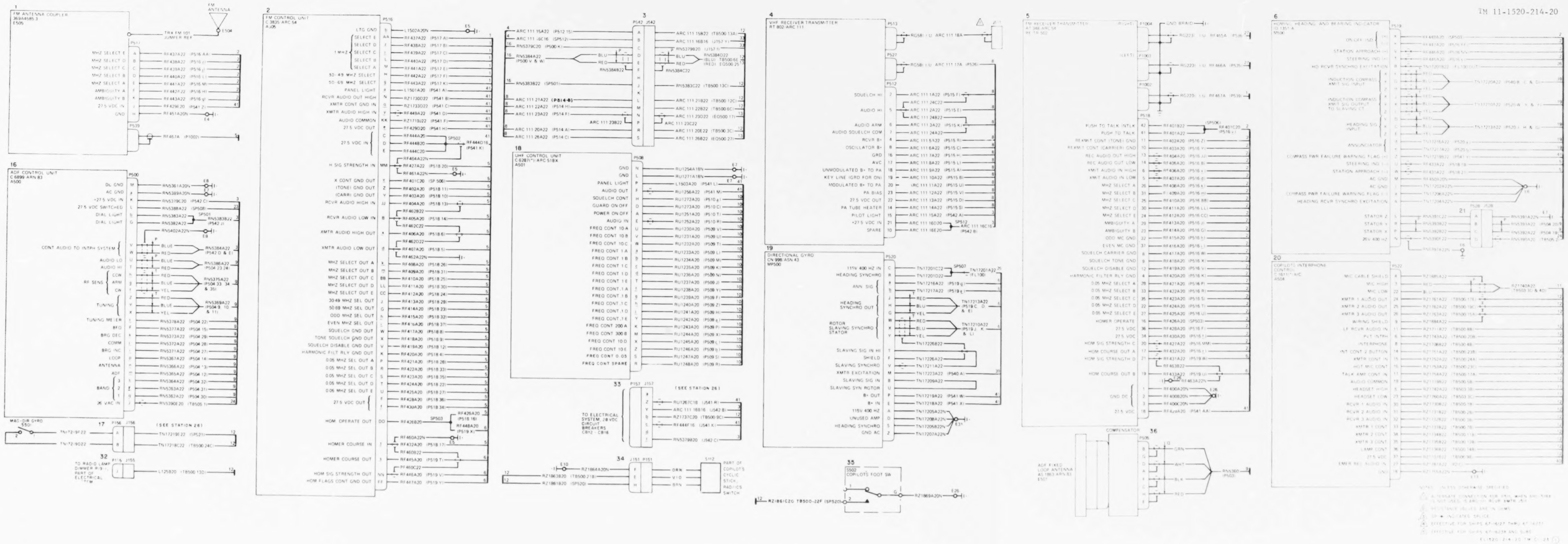

NOTES: UNLESS OTHERWISE SPECIFIED
ALTERNATE CONNECTION FOR P511 WHEN ARC-51BX IS NOT USED, IS ARC-111 RCVR XMTR J511
RESISTANCE VALUES ARE IN OHMS
SP ● INDICATES SPLICE
EFFECTIVE FOR SHIPS 67-16127 THRU 67-16257
EFFECTIVE FOR SHIPS 67-16258 AND SUBS
EL1520-214-20-TM-C1-25 (1)
35
S502
COPILOT'S FOOT SW
PART OF COPILOT'S CYCLIC STICK RADIO-ICS SWITCH

Figure 5-3 (1). Configuration wiring diagram (serial Nos. 67-16127 and subsequent) (sheet 1 of 3).

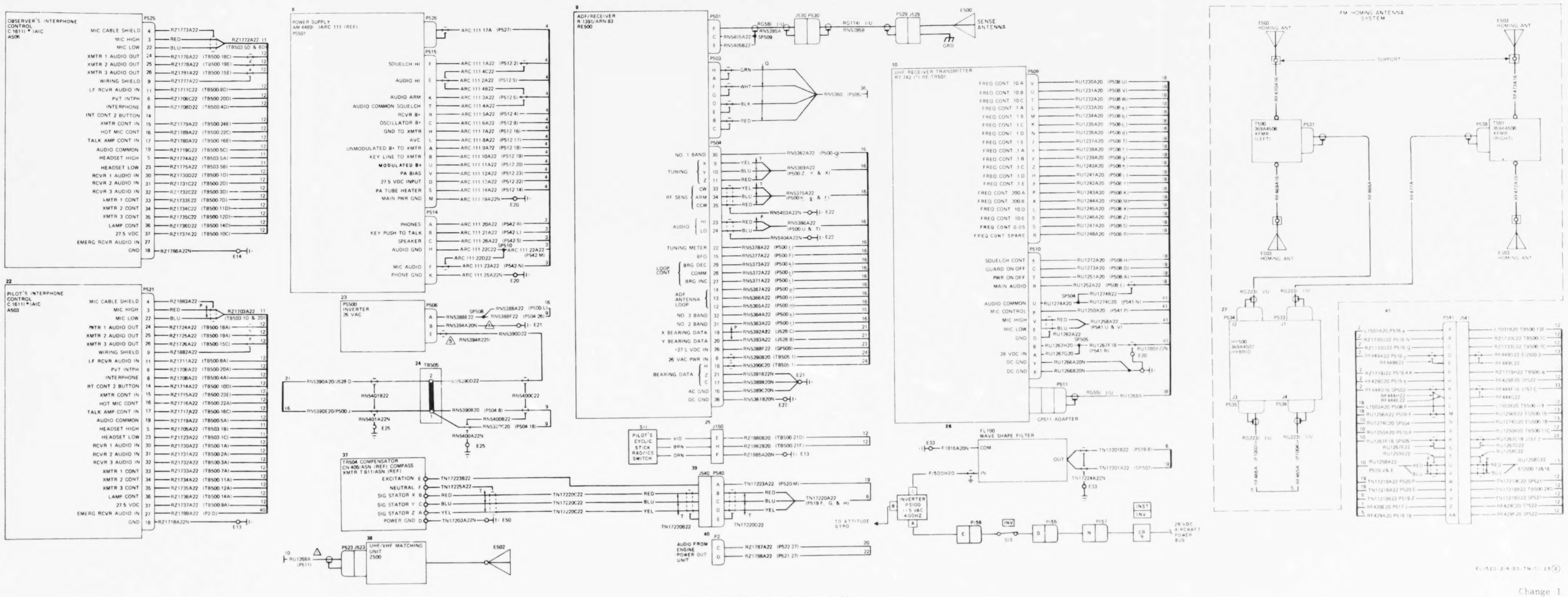
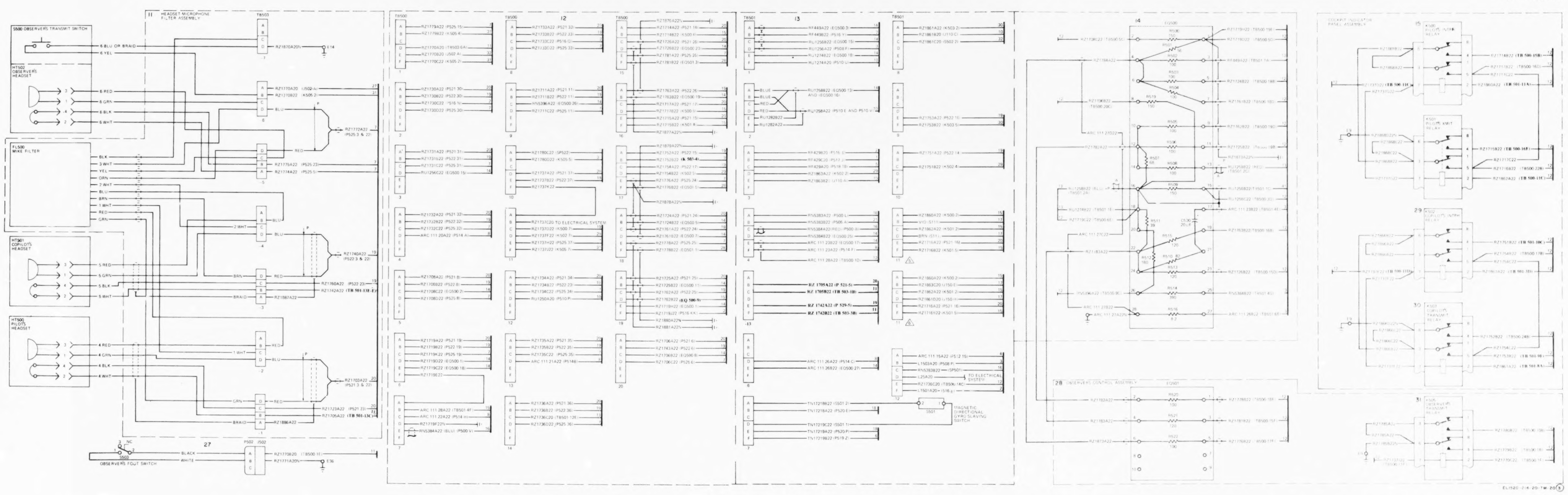

OBSERVER'S INTERPHONE CONTROL C 1611(*)AIC A506
P525
MIC CABLE SHIELD 4 RZ1773A22
MIC HIGH 3 RED
MIC LOW 22 BLU
RZ1772A22 11 (TB503 5D & 6D)
XMTR 1 AUDIO OUT 24 RZ1776A22 (TB500 18C)
XMTR 2 AUDIO OUT 25 RZ1778A22 (TB500 19E)
XMTR 3 AUDIO OUT 26 RZ1781A22 (TB500 15E)
WIRING SHIELD 9 RZ1777A22
LF RCVR AUDIO IN 11 RZ1711C22 (TB500 8D)
PVT INTPH 6 RZ1706C22 (TB500 20D)
INTERPHONE 8 RZ1708D22 (TB500 4D)
INT CONT 2 BUTTON 14
XMTR CONT IN 15 RZ1779A22 (TB500 24E)
HOT MIC CONT 16 RZ1789A22 (TB500 22C)
TALK AMP CONT IN 17 RZ1780A22 (TB500 16E)
AUDIO COMMON 19 RZ1719G22 (TB500 5C)
HEADSET HIGH 5 RZ1774A22 (TB503 5A)
HEADSET LOW 23 RZ1775A22 (TB503 5B)
RCVR 1 AUDIO IN 30 RZ1730D22 (TB500 1D)
RCVR 2 AUDIO IN 31 RZ1731C22 (TB500 2D)
RCVR 3 AUDIO IN 32 RZ1732C22 (TB500 3D)
PILOT'S INTERPHONE CONTROL C 1611(*)AIC A503
P521
EMERG RCVR AUDIO IN
GND
E14
E13
POWER SUPPLY AM 4489( )ARC 111 (REF) PS501
P526
ARC 111 17A (P527)
P515
SQUELCH HI F ARC 111 1A22 (P512 2)
ARC 111 4C22
AUDIO HI E ARC 111 2A22 (P512 5)
ARC 111 4B22
AUDIO ARM K ARC 111 3A22 (P512 6)
AUDIO COMMON SQUELCH T ARC 111 4A22
RCVR B+ R ARC 111 5A22 (P512 4)
OSCILLATOR B+ C ARC 111 6A22 (P512 8)
GND TO XMTR H ARC 111 7A22 (P512 16)
AVC L ARC 111 8A22 (P512 17)
UNMODULATED B+ TO XMTR A ARC 111 9A22 (P512 18)
KEY LINE TO XMTR B ARC 111 10A22 (P512 19)
MODULATED B+ U ARC 111 11A22 (P512 20)
PA BIAS V ARC 111 12A22 (P512 23)
27.5 VDC INPUT
PA TUBE HEATER
MAIN PWR GND
P514
PHONES
KEY PUSH TO TALK
SPEAKER
AUDIO GND
MIC AUDIO
PHONE GND
E20
INVERTER 26 VAC
TB505
E25
COMPENSATOR CN 405 ASN (REF) COMPASS XMTR T 611 ASN (REF)
EXCITATION
NEUTRAL
SIG STATOR X
SIG STATOR Y
SIG STATOR Z
POWER GND
UHF/VHF MATCHING UNIT Z500
P523 J523
E502
ADF/RECEIVER R 1391/ARN 83 RE500
P501
RG58( )U
RN5395A
RN5405A22
SP509
RN5405B22
J530 P530
RG114( )U
RN5395B
P529 J529
E500
SENSE ANTENNA
GRD
P503
GRN
WHT
BLK
RED
Q
RN5360 (P505)
36
P504
NO 1 BAND 30 RN5362A22 (P500 Q)
TUNING
YEL
BLU
RN5369A22 (P500 Z, Y & X)
RF SENS
AUDIO
TUNING METER
BFO
LOOP CONT
BRG DEC
COMM
BRG INC
ADF ANTENNA LOOP
NO. 3 BAND
NO. 2 BAND
X BEARING DATA
Y BEARING DATA
+27.5 VDC IN
26 VAC PWR IN
BEARING DATA
AC GND
DC GND
E21
E27
PILOT'S CYCLIC STICK RADIO ICS SWITCH
TN17220B22
TN17220D22
TN17220A22 (P519 F, G & H)
TO ATTITUDE GYRO
INVERTER PS100 115 VAC 400HZ
40 P2
AUDIO FROM ENGINE POWER OUT UNIT
C RZ1787A22 (P522 27) 20
D RZ1788A22 (P521 27) 22
10
UHF RECEIVER TRANSMITTER RT 742 (*) RE TR501
P509
FREQ CONT 10 A
FREQ CONT 10 B
FREQ CONT 10 C
FREQ CONT 1 A
FREQ CONT 1 B
FREQ CONT 1 C
FREQ CONT 1 D
FREQ CONT 1 E
FREQ CONT .1 A
FREQ CONT .1 B
FREQ CONT .1 C
FREQ CONT .1 D
FREQ CONT 200 A
FREQ CONT 300 B
FREQ CONT 10.0
FREQ CONT 10.E
FREQ CONT 0.05
FREQ CONT SPARE
P510
SQUELCH CONT
GUARD ON OFF
PWR ON OFF
MAIN AUDIO
AUDIO COMMON
MIC CONTROL
MIC HIGH
MIC LOW
GND
28 VDC IN
DC GND
CP511 ADAPTER
FL100 WAVE SHAPE FILTER
COM
OUT
IN
E33
INST INV
28 VDC AIRCRAFT POWER BUS
FM HOMING ANTENNA SYSTEM
E503 HOMING ANT
SUPPORT
RF470A16
RF473A16
T500 369A4508 XFMR (LEFT)
P537
T501 369A4508 XFMR (RIGHT)
P538
RF469A16
RF468A
RF471A
RF472A16
TN17219C22 SP521
TN17218B22 TB500 24E
TN17219D22 SP521
RF429C20 SP522
RF429F20 SP522
EL1520-214-20-TM-C1-23(2)

Figure 5-3(2). Configuration wiring diagram (serial Nos. 67-16127 and subsequent) (sheet 2 of 3).


HEADSET MICROPHONE FILTER ASSEMBLY
S500 OBSERVERS TRANSMIT SWITCH
HT502 OBSERVERS HEADSET
FL500 MIKE FILTER
HT501 COPILOTS HEADSET
HT500 PILOTS HEADSET
OBSERVERS FOOT SWITCH
I1
I2
I3
I4
27
28
29
30
31
K505 OBSERVERS TRANSMIT RELAY
EL1520-214-20-TM-20 (3)

EL10G037

Figure 5-2 (3). Configuration Wiring Diagram (Serial Nos. 65-12918 through 67-16126) (Sheet 3 of 3).